

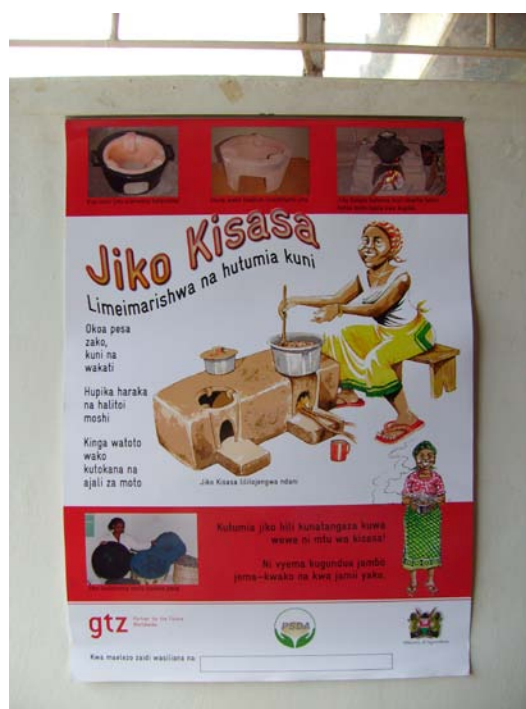
ANNEXES

Results Assessment

Findings from the Survey of Impacts of the Stove Project in Transmara, Western and Central Cluster of Kenya

Conducted from October 2007 to January 2008

Final report



Authors:

Melanie Djédjé, Anna Ingwe, Pauline Wanyohi, Verena Brinkmann, Jacob Kithinji,

gtz



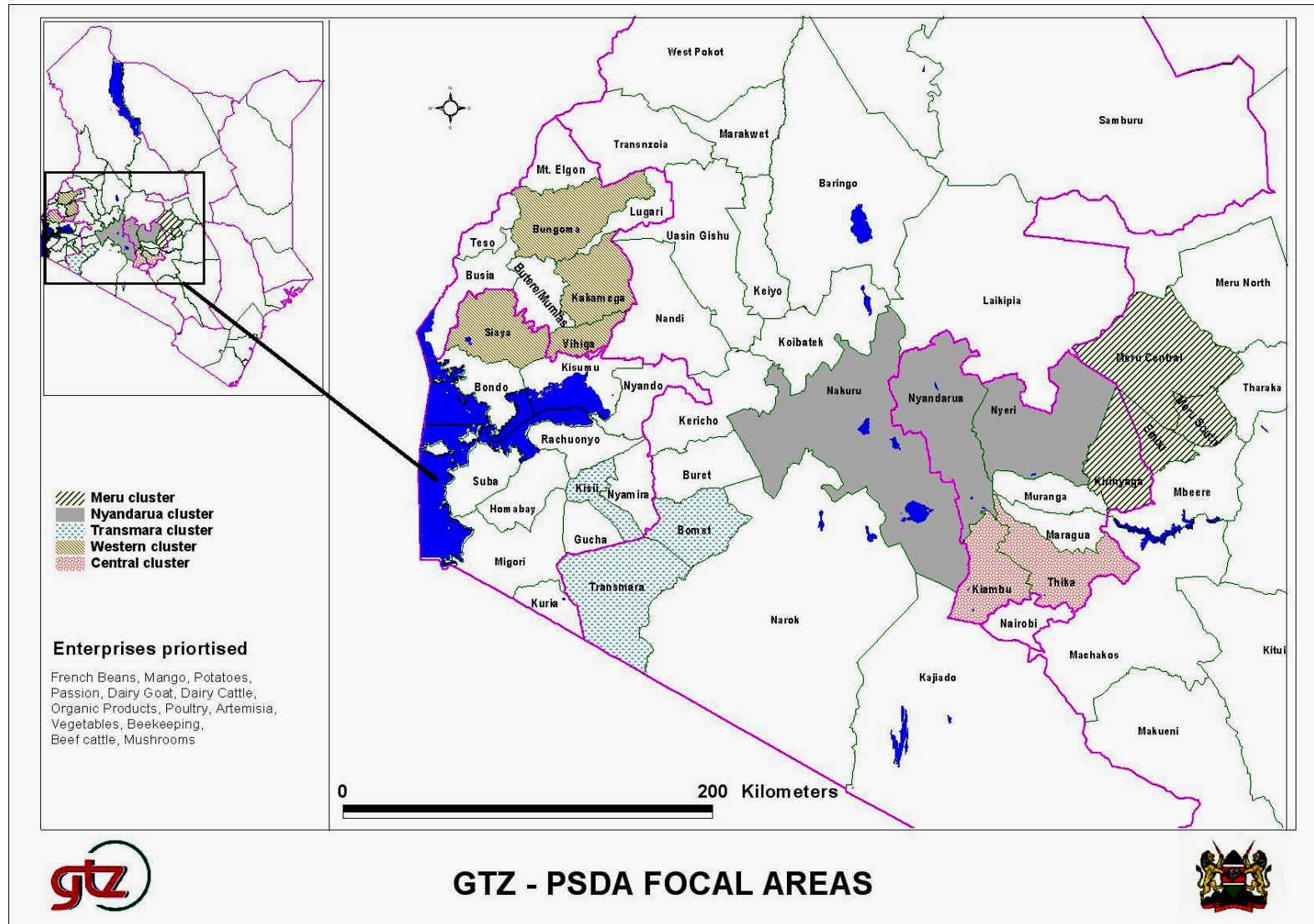
Promotion of Private Sector Development in Agriculture (PSDA)
Stove Project
Energising Development (EnDev)

Table of Content

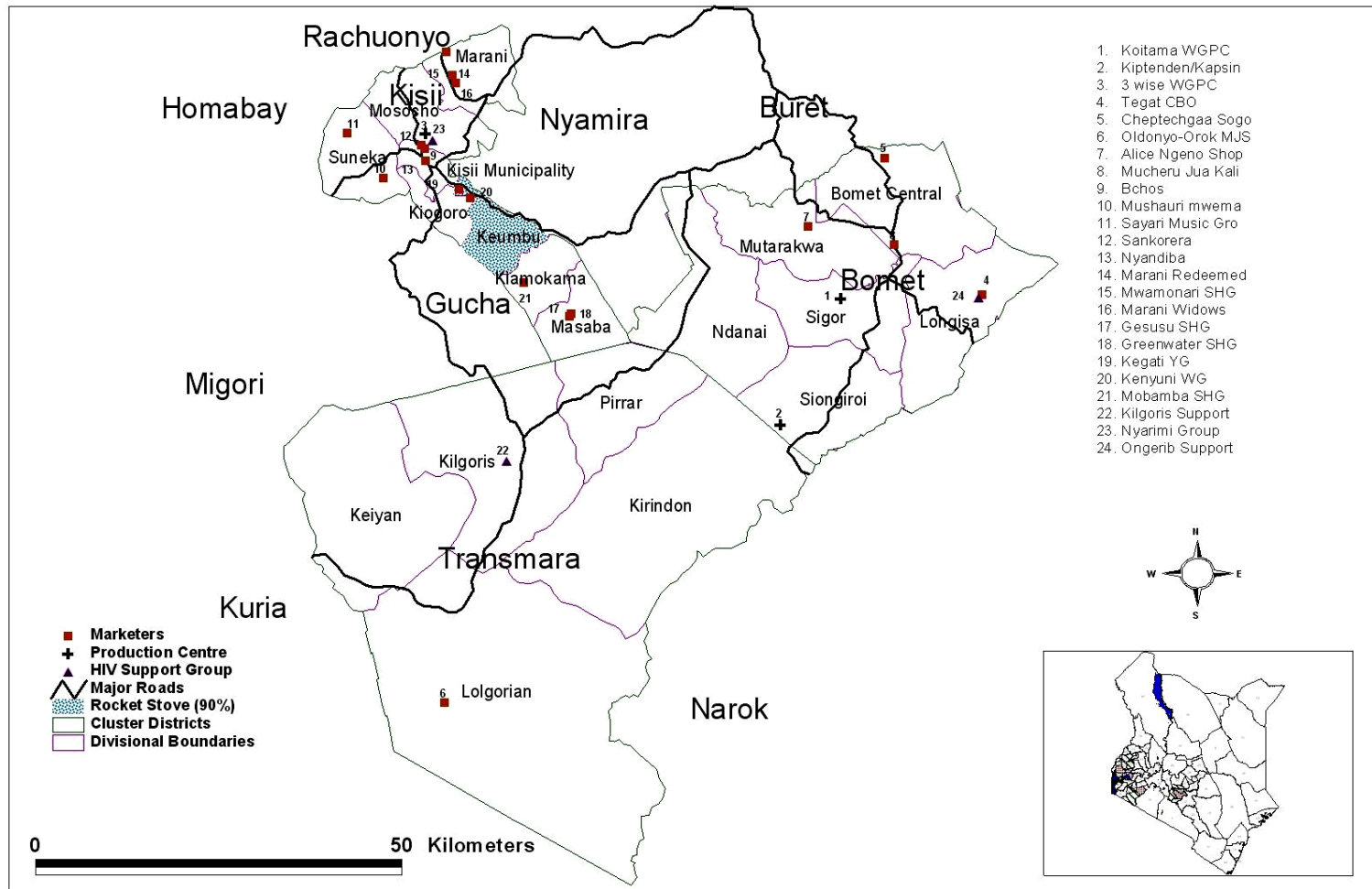
	Page
Annex I: Maps of the focal areas of PSDA activities	3
Annex II: Description of the PSDA focal areas	7
Annex III: Results chains for the stove project	9
Annex IV: Sustainability criteria for self assessment of EnDev projects	10
Annex V: Questionnaires for households, stove dealers, productive end-users	12
Annex VI: MAPP - PRA tools for focal group discussions	34
Annex VII: Steps and procedures of the survey	37
Annex VIII: Incidence of poverty in Kenyan Provinces	40
Annex IX: Poverty criteria for selection of households by village chiefs	41
Annex X: Description of Kenyan improved cookstove (ICS)	43
Annex XI: Additional household survey results	50
Annex XII: Additional producer survey results	54
Annex XIII: List of good cooking practices and their effects	60
Annex XIV: List of field team and participants	61

ANNEX I

PSDA Focal Areas in Western Kenya



Transmara Cluster - Stoves Activities



Western Cluster Districts

This map displays the Western Cluster Districts in Kenya, including Bungoma, Kakamega, Siaya, Vihiga, and Kisumu. It highlights major towns, municipalities, and trading centers, along with the road network and district boundaries. The map also shows the location of Lake Victoria and Lake Tanganyika.

Major Towns

- City (Red square)
- Municipality (Black circle)
- Township/Town (Black triangle)
- Trading Centre (Orange dot)

Road Network

- Road Network (Dashed line)

Western Cluster Districts

- Western Cluster Districts (Thick black line)

Divisional Boundaries

- Divisional Boundaries (Thin black line)

Districts.shp

- Districts.shp (Thin grey line)

Lakes.shp

- Lakes.shp (Blue area)

0 70 Kilometers

ANNEX II

Description of PSDA Focal Areas

Transmara Cluster

The Transmara cluster comprises three districts: Bomet, Kisii and Transmara. The total area of the three districts is 49,929 square kilometres. The area has some 232,000 households. The 1999 census projection put the combined total population for the three districts at 1,132,721. Some districts are characterised by high population density (950 people per sq. km.), with very small parcels of land and practising very intensive farming. In Kisii district, even forest land has been allocated to individuals for farming activities.

Bomet district has a population density of 288 persons per square kilometre, with many people farming and grazing animals. The district has a low coverage of forests and firewood is a big problem in the area. The district is vulnerable to environmental degradation, caused by the remaining forest being cleared for charcoal production, firewood and settlement.

Transmara district covers a total of 2,828 square kilometres, with 33,119 households in the district and a population of 170,591. The district lies within the Maasai Mara game reserve, which was initially forested, but the forest is rapidly being depleted due to charcoal burning and clearing areas for farming. This pressure on the forested area leads to a loss of wildlife.

Western Cluster

The Western cluster comprises five districts, namely, Bungoma, Kakamega, Vihiga, Siaya and Kisumu. Two more districts have been included into the programme intervention zone (Butere and Mumias Districts) which are not cluster districts but lie within the sugar belt which has an acute firewood problem.

Bungoma district has an estimated population of 1,162,203 and a population density of 561 persons per square kilometre. There is adequate rainfall which is well distributed throughout the growing season. The average annual rainfall ranges from 1,494 millimetres to 1692 millimetres. There is ungazetted forest¹ cover of 2030 hectares. Coffee is planted on approximately 4500 hectares, sugarcane covers 27,000 hectares. Tobacco is mainly found in Sirisia division. Mixed farming and dairy farming is practised on a subsistence basis, and mixed farming is practised commercially. Mixed farming includes maize, beans, sweet potatoes, vegetables, and bananas. Because sugarcane and tobacco are cultivated, trees are not grown on the farms, resulting in serious shortages of firewood. Additionally, there is a big demand for firewood for traditional tobacco curing, which uses substantial quantities of biomass.

Kakamega District has approximately 2000 hectares of tea plantation, 700 hectares of coffee plants, and 15,000 hectares of sugarcane. Normal small-scale mixed farming takes place at subsistence level. As in Bungoma district, these mixed farms grow maize, beans, sweet potatoes, vegetables, and bananas, and small-scale dairy farming is practised. The Kakamega forest cover extends over 15,985 hectares, with 4469 hectares of gazetted natural forest reserve.

Vihiga district covers an area of 563 square kilometres. It has an estimated population of 621,399 and a population density of 1,159 persons per square kilometre. The average annual rainfall is quite high (1808 mm per annum). Coffee is cultivated on 1250 hectares and tea is grown on 2000 hectares. Normal small-scale mixed subsistence farming is practised, with crops that include maize, beans, sweet potatoes, vegetables, and bananas. Dairy farming is done in zero grazing units² and is to some extent commercialized. Gazetted forest

¹ A gazetted forest is one that has been surveyed, demarcated on the ground and declared as a Forest Reserve

² Farming system where animals are kept in stalls, where they are fed, rather than allowing them to graze in the fields

cover extends over 4190 hectares. The high population density and small farm sizes make firewood shortages a very serious problem for the District. This is borne out by the booming firewood business.

Kisumu district covers a total of 919 square kilometres and has an estimated population of 565,520. The population density stands at 615 persons per square kilometre. Kisumu district has seasonal crops of cotton and rice which are grown both commercially and on a small scale.

Siaya district covers a total area of 1520 square kilometres and has an estimated population of 485,862. The population density is 320 persons per square kilometre. Siaya has no cash crops except for small-scale subsistence farms which mainly grow maize, beans and sweet potatoes.

Butere Mumias has a total area of 939 square kilometres, with an estimated population of 553,399 and a population density of 589 persons per square kilometre. The average rainfall is between 1829 mm and 2010 mm per year. The district is predominantly a sugarcane belt, with 43,000 hectares under sugarcane cultivation. Butere Mumias has no forest cover.

Central cluster

The Central cluster comprises four districts: Kiambu, Thika, Maragwa and Murang'a. The major part of the cluster is highly populated with small pieces of land used for subsistence farming. The remaining area comprises large-scale tea and coffee plantations owned by more affluent farmers involved in agribusiness.

The **Muranga** District has four administrative Divisions: Kiharu, Kangema, Kahuro and Mathioya, comprising eighteen locations and 73 sub-locations. The total area extends over 930 square kilometres; the Aberdare forest covers 174 square kilometres and 600 square kilometres is arable land. The total population is 350,000, belonging to around 85,000 families. The average farm size is 0.7 hectares. The District ranges from forested areas to a marginal cotton zone in the lowlands. Small tea plantations cover 6004 hectares, and include four tea factories. Coffee plantations cover 6270 hectares, with 64 coffee factories. Other agricultural products grown include maize, beans, dairy, poultry and horticulture.

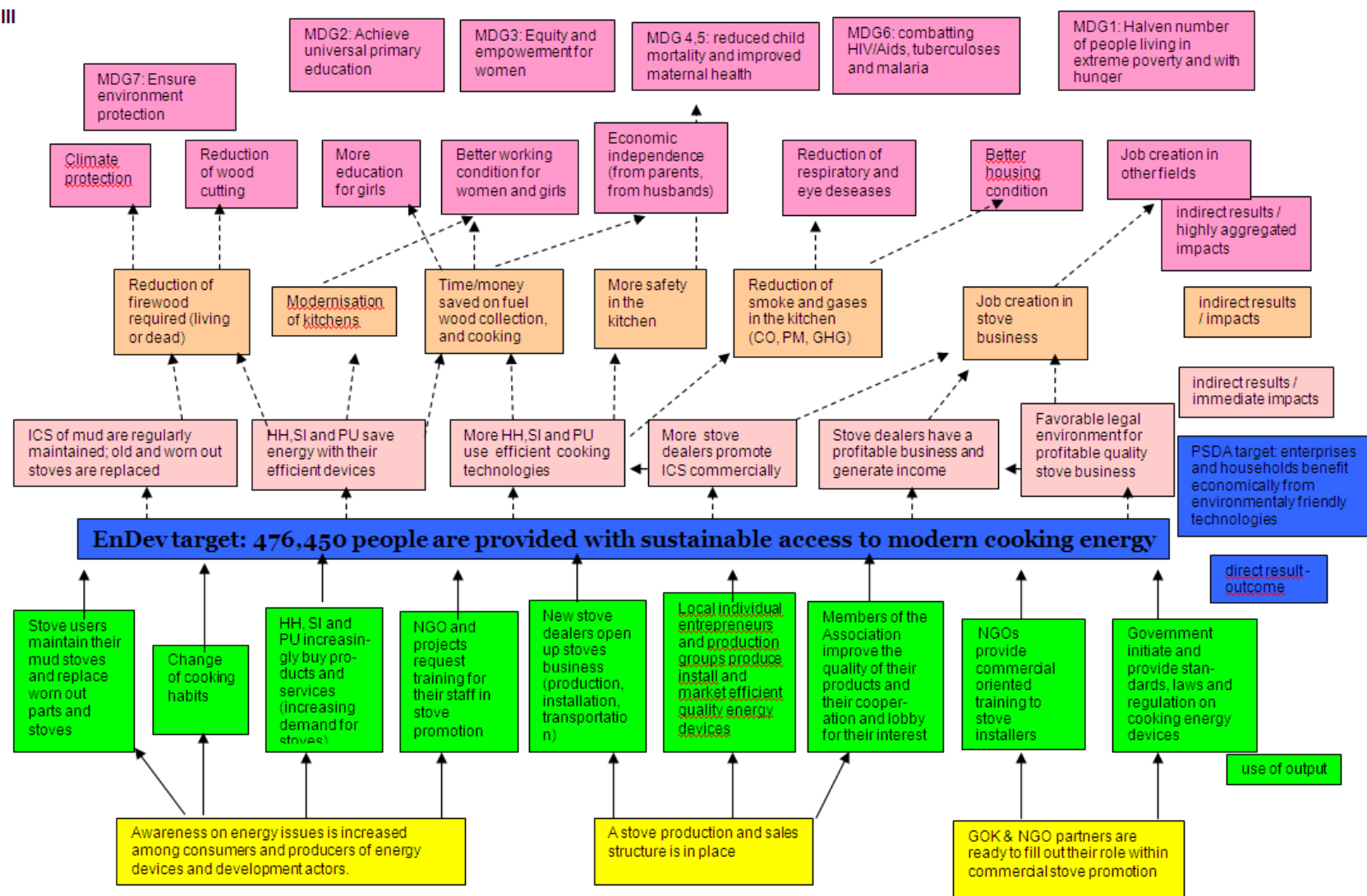
The **Thika** district covers a total area of 1960 square kilometres, of which 1492 square kilometres are arable land and 177 square kilometres are forested. The total population is 645,713 with a density of 329 persons per sq.km (1999 census). The main enterprises are based on the cultivation of tea, coffee, pineapples and flowers. There are 256 large scale farms, of which 254 are coffee plantations, one is a tea plantation, and one is an industrial pineapple farm (*Delmonte*).

The **Maragwa** district extends over 1065 square kilometres, with arable land taking up 652 square kilometres. Non-arable land (including forest) extends over 187 square kilometres. The total population is 418,044 and the population density is 393 persons per square kilometre. The average farm size is 0.8 hectares. The district extends from forest to marginal cotton zone. The annual rainfall ranges from 900 mm to 2700 mm. The district has small-scale tea and coffee plantations. There are four tea factories and 1111 coffee factories.

The **Kiambu** district covers 476.2 sq.km and 652 sq.km of arable land (80%) with an average farm size of 0.8 hectares. The total population is 361,257, and the population density is 318 persons per square kilometre. There are coffee, tea and horticultural crops (mainly flowers). Tea is grown both on small and large estates. Coffee is grown on large and small plantations.

ANNEX III: Results Chains

ANNEX III Results Chains



ANNEX IV:

Self-assessment of sustainability criteria for EnDEV projects

Economic sustainability for technology providers/producers and service providers

Key question: 'Will the project enter a self-sustaining market situation, or create one, where income exceeds expenditure in the long term?'

General points:

- Will the market be self-sustaining after five years?
- Will providers / producers have technical skills after five years?
- Will providers / producers have business skills after five years?
- Has action been taken to ensure quality control of services and products?

Technology providers / producers

- Do prices cover costs and create profit?
- Is the technology affordable to target group consumers?
- Does an after-sales guarantee structure exist?
- Is there scope for product development?

Service providers:

- Is there sufficient income generated to cover all costs?
- Are tariffs set to cover costs?
- Do most consumers pay for services?
- Financial reports of community utilities

Subsidies:

- Is there a clear exit strategy?
- Is sale of the products viable in the longer term without any subsidy?

Consumers' opinions on product sustainability

Key question: 'Are the technologies and services offered attractive and affordable from an energy user's perspective?'

General points:

- Are the products and services attractive and affordable?
- Are there different products available for different income groups?
- Do the products / services contribute to development?
- Are there low risk credit schemes?
- Products suited for large user groups
- Are the goods and services what we want? (consumer satisfaction)
- User awareness of benefits

Energy for productive use

- Additional income is created by productive use of energy

Policy requirements

Key question: 'Is the project ethos in line with policies at local, regional and national levels?'

General points:

- Is the project in line with local, regional and national government policies?

- Legal framework is supportive or at least not prohibitive

Social, cultural and environmental considerations

Key question: 'Does the project take these aspects into account?'

- Do the service and product fit into the cultural environment?
- Does the project meet local demand?
- Are the living conditions improved, particularly for women?
- Are the key actors (entrepreneurs, consumers) aware of all the benefits?
- Is the project protective, or at least non-damaging to the immediate environment?

ANNEX Va: GENERAL HOUSEHOLD QUESTIONNAIRE

The following has to be filled out before the interview:

Serial No _____ Date _____
 Supervisor name _____
 Interviewers name _____
 Cluster _____ District _____
 Division _____ Location _____
 Sublocation _____ Village _____
 Household Categories: A) urban _____ rural _____
 B) poor _____ medium _____ better off _____
 Beginning time _____ End time _____

Introduction

Good morning/afternoon. My name is ----- sent by Ministry of Agriculture. We are carrying out a study in this area on the cooking habits and different types of stoves (*majiko*) used by women in the kitchen. We met your village chief the other day and he recommended us to see you to help us with the questions we have on the cooking practices. All the information given will be treated with confidentiality and be used for the purposes of the study only. Thank you very much for welcoming us!

SECTION A: Personal Information

1. Who is the head of the household?
 1 = Husband 2 = Self 3 = Others (specify) _____
2. What is the occupation of the head of household?
 1 = Farming 2 = Salaried/Employed 3 = Businessman /self employed
 4 = Part time employed 5 = Others (specify) _____
3. What is the highest level of education of the head of household?
 1 = None 2 = Can read & write 3 = Primary 4 = Secondary 5 = College
 6 = University 7 = -Technical 8 = Others (specify) _____
4. What is your age? (*approximately*) _____
5. What is your highest level of education? 1 1 =
 None 2 = Can read & write 3 = Primary 4 = Secondary 5 = College
 6 = University 7 = -Technical 8 = Others (specify) _____
6. How many people regularly live and eat in the household? Specify numbers. (*Define household to include all the people who take meals regularly from the same pot*)
 1 = Older people (>64 years) _____
 2 = Adults (>16 years) _____
 3 = Children (<15 years) _____
 4 = Total number of household members _____

SECTION B: Stove information

Answers to questions 7 to 10 to be filled in the table below.

7. What stoves are present in the household? (*question and own observation*)

8. Condition of the improved stoves present (*own observation; several answers possible*):

Firewood Jiko Kisasa one pot or two pots: 1 = good condition, 2 = cracks on the body, 3 = cracks on the liner, 4 = broken door, 5 = broken pot-rest

Firewood Kuni Mbili: 1 = good condition, 5 = broken pot-rests, 6 = worn out metal, 7 = broken liner

Rocket mud stove without chimney: 1 = good condition, 2 = cracks on the body, 8 = no pot-rests, 9 = no firewood shelf, 10 = worn out combustion chamber

Rocket mud stove with chimney: 1 = good condition, 2 = cracks on the body, 8 = no pot-rests, 9 = no firewood shelf, 10 = worn out combustion chamber, 11 = cracked / broken chimney

9. For how long have you had these stoves? (*in months or in years for each stove*)

10. What stove do you use everyday for cooking and for boiling hot water?

	7. Stoves present (number of stove)	8. Condition of improved stoves	9. Age of stove - months or years	10. Stove used daily: cooking hot water	
Three stone fire					
Firewood Jiko Kisasa – one pot					
Firewood Jiko Kisasa – two pots					
Firewood Kuni Mbili					
Rocket Mud Stove – one pot					
Rocket Mud Stove – two pots					
Kenya Ceramic Jiko (charcoal)					
Charcoal all metal stove					
Sawdust stove					
Kerosine wick (chinese)					
Kerosine pressure					
LPG 6 kg (meko)					
LPG 2-burner					
Electric stove (1 or 2 rings)					
Other (specify)					

11. Do you use a fireless cooker? Yes _____ No _____
12. *For all households where there is a 3 stone fireplace, ask the following question:*
Do you use this stove: every day _____ often _____ sometimes _____
for special occasion _____ never _____
13. *For all households where there is no improved firewood stove in the household, ask the questions:*
A) Do you know improved firewood stoves? Yes _____ No _____
B) If yes, which type of stoves do you know?
Jiko Kisasa _____ Jiko Kuni Mbili _____ Rocket Mud stove _____
Others (specify): _____
C) Why don't you use one? No interest _____ No money _____
Don't know where to find _____ Don't use firewood _____
Other (specify) _____

SECTION C: Cooking information

14. Do you cook:
inside the house _____ inside a separate kitchen _____ outside _____
If cooking is done inside, is it:
Throughout the year: _____ Only during the rainy season: _____
15. Do you cook your meals on one stove (*one dish after the other*) or on two stoves at the same time? One stove _____ or two stoves _____
Other (specify) : _____
16. How many times do you cook food for your family per day? (*breakfast, lunch, supper*)?
1 meal : _____ 2 meals: _____ 3 meals: _____ more: _____
17. Do you warm up meals? Yes _____ No _____
If yes, when? morning _____ lunchtime _____ evening _____
For special occasions (specify) _____
18. Do you use your stove for other puposes than cooking meals? (*several answers possible*)
Boiling water: _____ Space heating: _____ Lighting: _____
Making local brew: _____ Other: _____
19. *Own observation on cooking practices: if the woman is found cooking, does she*
- use dry firewood? Yes: _____ No: _____
- use few sticks? Yes: _____ No: _____
- use split firewood? Yes: _____ No: _____
- use a lid on the pot? Yes: _____ No: _____
- B) *Observe also, whether there is smoke in the kitchen*
Yes: _____ No: _____

SECTION D: Fuelwood information

20. What fuels do you use to cook? (*several answers possible*)

1= firewood, 2= maize cobs 3= maize / sorghum stalks
4= twigs 5= sawdust 6= charcoal
7= kerosine 8= gas 9= electricity
10= other: _____

21. What is the primary fuel used for cooking? (1 – 10) _____

What is the second important fuel used? (1 – 10) _____

What is the third important fuel used? (1 – 10) _____

22. If firewood is used, is it:

collected: Yes _____ No _____ bought: Yes _____ No _____

If collected, where does it come from? (*several answers possible*)

1= Own farm, 2= Open land 3= Public forest/bush,
4 = Others (specify) _____

23. Who collects the firewood? (*several answers possible*)

Women: always _____ sometimes: _____ never: _____

Girls: always _____ sometimes: _____ never: _____

Boys: always _____ sometimes: _____ never: _____

Men: always _____ sometimes: _____ never: _____

Others (specify): _____

24. If the firewood is collected:

A) How often do you collect it? _____ times per week / per month

B) When do you leave the house? _____

C) When do you come back? _____

D) (*Fill in the time used for collection:* _____ hours)

25. If the firewood is bought, how much money do you spend:

per day: _____ or per week: _____ or per month: _____

26. If you **collect and buy** firewood, how much is bought and how much is collected?

half / half: _____ more firewood collected: _____

more firewood bought: _____

27. *For households, where the main stove is not a 3 stone fire, how was it in the past:*

A) How many times did you go for firewood collection per week, when you were cooking on the 3 stones? _____ times

B) How much money did you spend for firewood, when you were cooking on the 3 stones? Per day: _____ or per week: _____ or per month: _____

*For those households without an improved firewood stove the questionnaire ends here!!!
ASANTE SANA!!!*

Please continue for those households with an improved firewood stove with the following questions:

SECTION E: Improved firewood stoves (only for households with improved stoves)

28. *If the improved firewood stoves are in a **good condition** (see table No. 8), ask:*

Do you do regular maintenance of the stove? Yes; _____ No: _____

If No, why: _____

29. If any of the improved firewood stoves is **not in a good condition** (see table No. 8) ask:

A) Do you see any difference in the performance of the stove compared to its condition when it was new? Yes: _____ No: _____

B) If yes, what is the difference: _____

C) Why the maintenance of the stove has not been done?

No time: _____ No money: _____ Don't know how to do it: _____

Other reason: _____

30. Did you ever replace one of the improved firewood stoves?

A) Yes: _____ No: _____

B) If yes, which stove has been replaced? _____

C) Why did you replace it? _____

31. What do you see as an advantage of the improved firewood stove? (*several answers possible*)

1 = Fuel saving 2 = cooks fast 3 = Reduced smoke
4 = Saves money 5 = Clean kitchen 6 = less burns, accidents
7 = less respiratory diseases 8 = less eye diseases 9 = more comfort
9 = better taste of food 10 = Other (specify): _____

32. What is the most important advantage for you? _____

33. Does the improved firewood stove have any disadvantages for you? (*several answers possible*)

A) Yes: _____ No: _____

B) If yes, which ones?

1 = not possible to sit around the fire, 2 = not possible to roast maize / meat
3 = takes more time to cook 4 = can't cook on big pots
5 = needs maintenance 6 = can't cook certain meals
7 = can't use wet wood 8 = Other (specify) _____

34. What is the biggest disadvantage for you? _____

35. How much did you pay for your improved stove?

Firewood Jiko Kisasa – one pot	KSh
Firewood Jiko Kisasa – two pots	KSh
Firewood Kuni Mbili	KSh
Rocket Mud Stove – one pot	KSh
Rocket Mud Stove – two pots	KSh

36. How did you know about the improved stoves for the first time? (*several answers possible*)

1 = Radio 2 = TV 3 = brochure, leaflet, calenders
4 = neighbours, family, friends 5 = public meeting, field days
6 = NGOs 7 = producers 8 = marketing groups
9 = installers 10 = Others (specify) _____

37. As you are coming now to an end, please ask the Mama, whether she would like to add anything to this interview: _____

ASANTE SANA

ANNEX Vb:

Stove dealers (producer/builder, installer and marketer) Questionnaire

SERIAL NO. _____

Name of interviewer: _____

DATE: _____

NAME of stove dealer: _____

NAME of group (if applicable): _____

SEX: MALE _____ FEMALE _____

Address of stove dealer:

Districts _____ Division _____

Location _____ Sub-Location _____

Village _____

Introduction by cluster manager ...

Section A – General questions to all types of stove dealers

1. What is your household size? _____
2. Marital status:
1 = Married 2 = Single 3 = Widowed 4 = Separate/divorced
3. Age of stove dealer: _____
4. What is your highest level of education?
1 = None 2 = Can read & write 3 = Primary 4 = Secondary
5 = University 6 = College 7 = Others (specify) _____
5. What is your main occupation (source of income)?

Other occupations? _____
6. Which percentage do you contribute to the household income?
1 = up to 50% 2 = 50:50 3 = more than 50%
7. What is your engagement in the stove business? (*all options*)
Are you a:
1 = producer or stove builder
2 = installer
3 = marketer
8. How long have you been in the stove business? _____ years
9. If you are working in a group,
a) How long does your group been in the stove business? _____ years
b) What is the size of your group? _____ men and _____ women

10. Do other household members assist you in stove business?

1 = Yes 2 = No

If yes, in which way? _____

11. How much time do you spend on your stove business?

1 = _____ hours per day 2 = _____ days per week

3 = when called by clients

12. *If respondent is a woman:* Who takes care of your family when you go for stove duties?

13. How did you come to stove business?

1 = through GTZ project

2 = through other stove dealers

3 = by self initiation

4 = through other development actors (specify) _____

5 = others (specify) _____

14. Do you have an improved stove in your own kitchen?

1 = Yes 2 = No

a) If yes, which type?

1 = Jiko Kisasa Portable

2 = Jiko Kisasa fixed

3 = KCJ

4 = RMS portable

5 = RMS fixed 1 pot

6 = RMS fixed 2 pots

7 = Rocket brick stove

8 = others (specify) _____

b) Who installed your stove?

1 = Self

2 = Other person (specify) _____

c) Who maintains your stove?

1 = Self

2 = Other person (specify) _____

d) Did you replace your stove?

1 = Yes

2 = No

Section B – Specific questions for stove producers / builders:

15. What kind of stoves do you produce/build? (*several options*)

- 1 = Jiko Kisasa liner
- 2 = Jiko Kisasa portable
- 3 = Kenyan Ceramic Jiko
- 4 = RMS portable (Shielded)
- 5 = RMS fixed one pot
- 6 = RMS fixed two pots
- 6 = Rocket brick stove
- 7 = others (specify): _____

16. *Training*: Did you receive training?

- 1 = Yes
- 2 = No

If yes, fill out table below

a) Who trained you? (*several options*)

b) What kind of training did you receive? (*several options, enter numbers below*)

c) What did you receive to start your business? (*several options, enter numbers below*)

a) who trained you?	b) kind of training 1 = technical training in production/building 2 = technical training in kilns 3 = business management training 4 = organisational development training 5 = others (specify) _____	c) kind of start up provided 1 = moulds 2 = assistance for kiln construction 3 = others (specify) _____
1 = GTZ project		
2 = other stove dealers		
3 = other development actors (specify) _____		
4 = others (specify) _____		

17. Did you train others to become stove producers/builders?

- 1 = Yes
- 2 = No

If yes, how many? _____

18. Raw Material:

a) Which raw material do you need? (*mark for all answers in table below*)

b) How do you get your raw materials? (*write numbers corresponding to raw material*)

c) If purchased, how much do you pay per one stove? (*write price, if purchased*)

d) What are transport costs to get raw material? (*write price, if transport costs*)

e) How would you describe the availability of these materials? (*write numbers corresponding to raw material*)

a) Materials	b) getting material 1 = Purchased 2 = Producers land 3 = for free (public land) 4 = stove user	c) material costs per stove (in case it was purchased) <i>amount in KSh (roughly)</i>	d) transport costs to get raw material per stove <i>amount in KSh (roughly)</i>	e) Availability of raw material 1 = more than enough 2 = Just adequate 3 = Rather scarce

		5 = Others (specify) _____			4 = Very scarce
1	Clay				
2	Ant hill soil				
3	Sand				
4	Cement				
5	Bricks				
6	Banana stems				
7	Water				
8	Gras/Saw dust/leaves				
9	Others (specify) _____				
	Total costs	-----	_____ KSh	_____ KSh	-----

19. *Labour*. Do you hire labour?

1 = Yes

2 = No

a) If yes, for which production stages? (mark for all answers in table below)

b) How many men or women? (write numbers corresponding)

c) How much do you pay for hired labour per stove?

a) stage of production	b) number of		c) cost for labour per stove, <i>amount in KSh</i>
	male (M)	female (F)	
1 = acquisition of raw material			
2 = preparation of raw material			
3 = moulding of stoves			
4 = finishing and drying of stoves			
5 = firing stoves			
6 = marketing and selling of stoves			
7 = others (specify): _____			
= total			

20. Do you calculate for your own labour costs?

1 = Yes

2 = No

If yes, how much per stove? _____ KSh

21. *Kiln-firing*. Do you fire your clay stove or liners in any kind of kiln?

1 = Yes

2 = No

a) If yes, how much firewood do you need for firing per stove? _____ kg

b) What is the cost of the firewood for firing per stove? _____ KSh

c) How much does firing cost you per stove in total? _____ KSh

22. *Quality*. Which criteria for quality of stoves did you follow in production/building and firing?

1 = measurements 2 = door 3 = potrests 4 = finishing
 5 = firewood shelf 6 = chimney 7 = positioning in kitchen
 8 = others (specify) : _____

23. Did you make any adjustments or modifications to the original stove design?

1 = Yes 2 = No

a) If yes, which adjustments and modifications? _____

b) Why - give reasons : _____

24. Who does control the quality of your stoves?

25. Do your stoves have a label? (*question and observation*)

1 = Yes 2 = No

If yes, which is it? _____

26. Do you provide a warranty to your customer?

1 = Yes 2 = No

If yes, for how long? _____

27. Have you ever received feedback from your customers about the quality of your stove?

1 = Yes 2 = No

If yes, which feedback did you receive? _____

28. *Records:* Do you take records of your production/building and sales?

1 = Yes 2 = No

(*Ask for monitoring sheet – calculate accordingly if group-monitoring sheet*)

a) How many stoves do you produce/build per month? (*write number in table below*)

b) How many stoves do you sell per month in total? (*write number in table below*)

c) What is the selling price per stove? (*write number in table below*)

Stove	a) Production number per month in KSH	b) Sales number per month in KSH	c) Sales price in KSH
Jiko Kisasa liner			
Jiko Kisasa portable			
RMS portable (Shielded)			
RMS fixed one pot			
RMS fixed two pots			
Rocket brick stove			
Others (specify)			

29. Do you hand out or build stoves for free?

1 = Yes 2 = No

a) If yes, give reason: _____

b) How many stoves were given out for free? _____

30. Where do you sell your stove?

1 = at the market place

2 = at your production site

3 = at users home

4 = others (specify): _____

31. How many stoves to you sell to whom?

1 = _____ stoves to installers

2 = _____ stoves to marketers

3 = _____ stoves to users

4 = _____ stoves agricultural officers

5 = _____ stoves to others (specify) : _____

32. *Promotion*: How do you get your customers? (*several options*)

1 = through referrals

2 = own promotion activities (specify): _____

3 = through government (agricultural extension staff)

4 = project promotional activities (specify) : _____

5 = others (specify) : _____

33. Do you provide customers with information on good cooking practices?

1 = Yes

2 = No

a) If yes, what are your advices?

1 = drying firewood

2 = splitting firewood

3 = using lid

4 = pre-soaking

5 = food preparation before lighting fire

6 = installing windows

7 = installing shelves

8 = others (specify) : _____

b) Do you provide a user manual? 1 = Yes 2 = No

34. How many of your customers replaced worn out or old stoves?

35. *Income*:

a) How much do you earn in total per month from stoves business? _____ KSh

b) Do you generate reasonable profit from stove dealing? (*stove dealers own perception*)

1 = Yes

2 = No

If no, why do you proceed in stove business? (*Explanation*)

36. How much did you invest into infrastructure of your stove business (e.g. tools, workshop, machines, ...)?

1 = in kind (specify): _____

2 = money (specify): _____ KSh

37. Do you have any future plans regarding expanding your stove business (e.g. scaling up)?

1 = Yes

2 = No

If yes, what are your plans? _____

38. *If stove group*: What are your advantages of working in a group?

And what are disadvantages of working in a group?

Would you like to add anything? _____

Asante Sana!
Kwaheri!

Section C – Specific questions for Jiko Kisasa installers:

39. *Training:* Did you receive training?

1 = Yes 2 = No

a) If yes, who trained you? (*enter numbers below*)

b) What kind of training did you receive? (*several options*)

c) What did you receive to start your business? (*several options, enter numbers below*)

a) who trained you?	b) kind of training 1 = technical training in production/building 2 = business management training 3 = organisational development training 4 = others (specify) _____	c) kind of start up provided 1 = measurement 2 = tools 3 = others (specify) _____
1 = GTZ project		
2 = other stove dealers		
3 = other development actors (specify) _____		
4 = others (specify) _____		

40. Did you train others to become stove installers?

1 = Yes 2 = No

If yes, how many? _____

41. From whom do you buy liners? (*several options*)

1 = producer

2 = marketer

a) How much do you pay per liner? _____ KSh

b) How many liners do you buy per month? _____ liner

c) Do you buy quality labelled liners? 1 = Yes 2 = No

If yes, to which percentage? _____ %

42. Which raw material do you need for installation?

1 = clay

2 = Ant hill soil

3 = bricks

4 = stones

5 = Murram

6 = water

7 = others (specify) : _____

43. Who does provide raw material?

1 = customer of stove

2 = others (specify): _____

44. Is any labour hired?

1 = Yes

2 = No

If yes, by whom?

1 = installer

2 = customer

45. Do you calculate for your own labour costs?

1 = Yes

2 = No

If yes, how much per stove? _____ KSh

46. *Quality*. Which criteria for quality of stoves did you follow during installation?

1 = measurements 2 = door 3 = potrests 4 = finishing

5 = positioning in kitchen 6 = others (specify) : _____

47. Did you make any adjustments or modifications to the original stove design?

1 = Yes

2 = No

a) If yes, which adjustments and modifications?

b) Why - give reasons: _____

48. Who does control the quality of your stoves?

49. Do your stoves have a label? (*question and observation*)

1 = Yes

2 = No

If yes, which is it?: _____

50. Do you provide a warranty to your customer?

1 = Yes

2 = No

If yes, for how long? : _____

51. Have you ever received feedback from your customers about the quality of your stove?

1 = Yes

2 = No

If yes, which feedback did you receive?: _____

52. Do you take records of your installation?

1 = Yes

2 = No

If yes, how many stoves do you averagely install per month? _____ stoves

53. Do you commercially install stoves outside your location?

1 = Yes

2 = No

If yes, where? : _____

If yes, how many stoves do you install outside your location? : _____

54. Do you install stoves for free?

1 = Yes

2 = No

If yes, give reason: _____

If yes, to which percentage of stoves installed? _____ %

55. What is the price of installation per stove?

1 = installation including liner _____ KSh

2 = installation only without liner _____ KSh

56. *Promotion*: How do you get your customers? (*several options*)

1 = through referrals

2 = own promotion activities (specify) : _____

3 = through government (agricultural extension staff)

4 = project promotional activities (specify) : _____

5 = others (specify): _____

57. Do you provide customers with information on good cooking practices?

1 = Yes

2 = No

a) If yes, what are your advices?

1 = drying firewood

2 = splitting firewood

3 = using lid

4 = pre-soaking

5 = food preparation before lighting fire

6 = installing windows

7 = installing shelves

8 = others (specify) : _____

b) Do you provide a user manual? 1 = Yes 2 = No

58. How many of your customers asked you for maintenance of their stove?

59. How many of your customers replaced worn out or old stoves?

60. *Income*:

a) How much do you earn in total per month from stoves business? _____ KSh

b) Do you generate reasonable profit from stove dealing? (*stove dealers own perception*)

1 = Yes

2 = No

If no, why do you proceed in stove business? (*Explanation*): _____

61. Do you have any future plans regarding expanding your stove business (e.g. scaling up)? 1 = Yes 2 = No

If yes, what are your plans? : _____

62. *If stove group*: What are your advantages of working in a group?

And what are disadvantages of working in a group? _____

Would you like to add anything? _____

**Asante Sana!
Kwaheri!**

Section D – Specific questions for marketers:

63. Which stoves do you market?

1 = Jiko Kisasa Liner

2 = Jiko Kisasa portable

3 = others (specify) : _____

64. Did you receive training?

1 = Yes

2 = No

If yes, fill out table below

a) Who trained you?

b) What kind of training did you receive? (*several options*)

a) who trained you?	b) kind of training 1 = technical training in production/building 2 = technical training in kilns 3 = business management training 4 = organisational development training 5 = others (specify) _____
1 = GTZ project	
2 = other stove dealers	
3 = other development actors (specify) _____	
4 = others (specify) _____	

65. Did you mentor others to become stove marketers?

1 = Yes 2 = No

If yes, how many are serious marketers nowadays? : _____

66. From which producers do you buy the Jiko Kisasa portable or liners?

(name, location) : _____

a) How much do you pay per Jiko Kisasa portable or liners?

per portable _____ KSh and per liner _____ KSh

b) How many Jiko Kisasa or liners do you buy per month? _____

portable _____ and liners _____

c) Do you buy quality labelled portable and liners? 1 = Yes 2 = No

If yes, to which percentage? _____ %

67. Do you hire labour?

1 = Yes

2 = No

a) If yes, how many men or women? (*write numbers corresponding*)

b) How much do you pay for hired labour per stove?

	a) number of		b) cost for labour per stove, amount in KSh
	male (M)	female (F)	
1 = Jiko Kisasa portable			
2 = Jiko Kisasa liner			
= total			

68. Do you calculate for your own labour costs?

1 = Yes

2 = No

If yes, how much per stove? _____ KSh

69. Do you provide a warranty to your customer?

1 = Yes

2 = No

If yes, for how long? : _____

70. Have you ever received feedback from your customers about the quality of your stove?

1 = Yes

2 = No

If yes, which feedback did you receive? : _____

71. Do you take records of your sales?

1 = Yes

2 = No

a) If yes, how many stoves do you sell per month as individual? _____ stoves

b) How many stoves do you sell per month as group? _____ stoves

72. What is the selling price per stove?

1 = Jiko Kisasa portable _____ KSh

2 = Jiko Kisasa liner _____ KSh

73. Do you provide stoves for free?

1 = Yes

2 = No

a) If yes, give reason: _____

b) How many: _____ %

74. Do you sell stoves outside your location?

1 = Yes

2 = No

a) If yes, where? : _____

b) How many stoves do you sell outside your location? _____

c) How far do you travel? _____

d) What are your transport costs per stove? _____ KSh

75. *Promotion*: How do you get your customers? (*several options*)

1 = through referrals

2 = own promotion activities (specify) : _____

3 = through government (agricultural extension staff)

4 = project promotional activities (specify) : _____

5 = others (specify) : _____

76. Do you provide customers with information on good cooking practices?

1 = Yes

2 = No

a) If yes, what are your advices?

1 = drying firewood

2 = splitting firewood

3 = using lid

4 = pre-soaking

5 = food preparation before lighting fire

6 = installing windows

7 = installing shelves

8 = others (specify) : _____

b) Do you provide a user manual? 1 = Yes

2 = No

77. How many of your customers replaced worn out or old stoves? _____

78. *Income:*

a) How much do you earn in total per month from stoves business? _____ KSh

b) Do you generate reasonable profit from stove dealing? (*stove dealers own perception*)

1 = Yes

2 = No

If no, why do you proceed in stove business? (*Explanation*): _____

79. How much did you invest into infrastructure of your stove business (e.g. tools, workshop, machines, ...)?

1 = in kind (specify) : _____

2 = money (specify): _____ KSh

80. Do you have any future plans regarding expanding you stove business (e.g. scaling up)?

1 = Yes

2 = No

If yes, what are your plans? : _____

81. *If stove group:* What are your advantages of working in a group?

And what are disadvantages of working in a group?

82. Have you ever faced a problem with the quality of liners/stoves you received from producers?

1 = Yes

2 = No

If yes, which problems (specify)? : _____

If yes, what did you do? _____

Would you like to add anything? : _____

**Asante Sana!
Kwaheri!**

ANNEX V c: Questionnaire for Productive use of ICS - Restaurants

The following has to be filled out before the interview:

Serial No _____ Date _____
 Interviewer's name _____
 Name of Restaurant _____
 Cluster _____ District _____
 Division _____ Location _____
 Sub location _____ Village _____
 Beginning time _____ End time _____

Introduction

SECTION A: General Information on the restaurant

38. What type of restaurant do you have?

1 = small kitchen in the street

2 = small indoor restaurant

3 = bigger indoor restaurant

4 = Other (specify) _____

39. When is your restaurant open?

1 = Morning

2 = Lunch

3 = Evening

4 = throughout the day

5 = at night (Bar)

6 = other: _____

40. For how many days per week do you open? _____ days

41. For how many years have you been running this restaurant?
 _____ years

42. How many people are working here with you?

Every day: _____ persons

Occasionally: _____ persons

43. What type of meals do you serve? (*Several answers possible*)

1 = tea and coffee

2 = omelette

3 = breakfast

4 = samozas

5 = soup

6 = ugali

7 = rice

8 = meat

9 = chapati 10 = beans and maize

11 = vegetables

12 = fish

13 = Other (specify) _____

SECTION B: Information on stoves

Please ask and have a look in the kitchen:

44. Number and type of stoves in the kitchen:

Type of stove	Number of stoves	Capacity of stove (pot-size in litres)	Stove used daily	
			Yes	No
1 = three stones fireplace				
3 = Institutional Rocket stove				
4 = household rocket				
5 = Kisasa				
6 = KCJ				
7 = Kerosene				
8 = gas cooker				
9 = electric cookers				
10 = small Bellerive stove				
11 = others (specify)				

45. How much did you pay for your improved stove(s)?

Firewood Jiko Kisasa – one pot	KSh
Firewood Jiko Kisasa – two pots	KSh
Firewood Kuni Mbili	KSh
Rocket Mud Stove – one pot	KSh
Rocket Mud Stove – two pots	KSh
Small Bellerive stove	KSh

46. How old are your improved firewood stoves?

stove No. 1: _____ months

stove No. 2: _____ months

stove No. 3: _____ months

47. Condition of the improved stoves present

(own observation; several answers possible):

Bellerive stoves: 1 = good condition,

2 = worn out metal, 3 = worn out fire chamber, 4 = no firewood shelf,

5 = missing, broken or blocked chimney, 6 = support ring, 8 = no/broken pot-rest,

11 = broken door,

Institutional Rocket stoves: 1 = good condition,

2 = worn out metal, 3 = worn out fire chamber, 4 = no firewood shelf,

7 = cracks on the body, 8 = no/broken pot-rests, 9 = no ash remover

Household Rocket stoves: 1 = good condition,

3 = worn out fire chamber, 4 = no firewood shelf, 5 = missing, broken or blocked chimney, 7 = cracks on the body, 8 = no/broken pot-rests

Firewood Jiko Kisasa one pot or two pots: 1 = good condition,

7 = cracks on the body, 8 = no/broken pot-rests, 10 = cracks on the liner, 11 = broken door

48. If the improved firewood stoves are in a **good condition** (see table No. 8), ask:

Do you do regular maintenance of the stove? Yes; _____ No: _____

If No, why: _____

49. If any of the improved firewood stoves is **not in a good condition** (see table No. 8) ask:

A) Do you see any difference in the performance of the stove compared to its condition when it was new? Yes: _____ No: _____

B) If yes, what is the difference: _____

C) Why the maintenance of the stove has not been done? _____

No time: _____ No money: _____ Don't know how to do it: _____

Other reason: _____

50. Did you ever replace one of the improved firewood stoves?

A) Yes: _____ No: _____

B) If yes, which stove has been replaced? _____

C) Why did you replace it? _____

51. What do you see as an advantage of the improved firewood stove? (several answers possible)

1 = Fuel saving

2 = cooks fast

3 = Reduced smoke

4 = Saves money

5 = Clean kitchen

6 = less burns, accidents

7 = less respiratory diseases 8 = less eye diseases 9 = more comfort
 9 = better taste of food 10 = Other (specify): _____

52. What is the most important advantage for you? _____

53. How much fuelwood do you save with the improved firewood stove?
 _____ kg / day or / week

54. How much money do you save due to fuelwood savings?
 _____ KSh / day or / week

55. What did you use the saved money for?
 1 = reinvestment in the restaurant 2 = increase of personal expenditure
 3 = Other (specify) _____

56. Does the improved firewood stove have any disadvantages for you? (*several answers possible*)

A) Yes: _____ No: _____
 B) If yes, which ones?
 1 = not possible to sit around the fire, 2 = not possible to roast maize / meat
 3 = takes more time to cook 4 = can't cook on big pots
 5 = needs maintenance 6 = can't cook certain meals
 7 = can't use wet wood 8 = Other (specify) _____

57. What is the biggest disadvantage for you? _____

58. *For all restaurants where a 3 stone fire is still in use, ask the following question:*

A) Do you use the 3-stone fire: every day _____ often _____ sometimes _____
 for special occasion _____ never _____

B) What is the advantage of using the 3 stone fire?
 1 = fast 2 = can take big pieces of wood 3 = can take big pans
 4 = 5 = 6 = other _____

59. How did you know about the improved stoves for the first time? (*several answers possible*)

1 = Radio 2 = TV 3 = brochure, leaflet, calendars
 4 = neighbours, family, friends 5 = public meeting, field days
 6 = NGOs 7 = producers 8 = marketing groups
 9 = installers 10 = Others (specify) _____

SECTION C: Information on Cooking practices

60. Do you cook:
 inside the kitchen (indoor) _____ outside (outdoor) _____

61. Did the cooks receive information on good cooking practices?

Yes: _____ No: _____

a) If yes, who explained the correct use? _____
 b) Which cooking practices were recommended? _____

62. *Own observation on cooking practices: if the stove is in use*

1 = use dry firewood Yes: _____ No: _____
 2 = use few sticks? Yes: _____ No: _____

3 = use split firewood? Yes: _____ No: _____
 4 = use a lid on the pot? Yes: _____ No: _____
 5 = good ventilation? Yes: _____ No: _____
For Bellrive only:
 6 = closed door? Yes: _____ No: _____

B) *Observe also, whether there is smoke in the kitchen*

Yes: _____ No: _____

63. As you are coming now to an end, please ask the Mama, whether she would like to add anything to this interview: _____

ASANTE SANA

ANNEX Vd: Interview guideline for local chiefs

SERIAL NO. _____

Name of interviewer: _____

DATE: _____

NAME: _____

SEX: MALE _____ FEMALE _____

Address of local chief:

Districts _____ Division _____

Location _____ Sub-Location _____

Village _____

Introduction:

1. How would you describe your location? _____

2. Which groups are active in your location? _____

3. Which are special developments or highlights during the last 5 years? _____

4. What are your observations about the environment (forests, land) over past 5 years? _____

5. What are your observations about the economics within your location over the past 5 years? _____

6. What are your observations about the health situation during past 5 years? _____

7. Do you know about improved cooking stoves?

Yes _____

No _____

If yes, what do you know about them?

8. Do you know how many HH have an improved cooking stove?

Yes _____

No _____

If yes, how many families are using one? : _____

9. Are there stove dealers within your location?

Yes _____

No _____

If yes, who are they? _____

10. What would be your priorities for the developments for the next 5 years?

11. What would you do to promote those developments? _____

ASANTE SANA

ANNEX VI: MAPP - PRA tools for focus group discussions

1 - TREND ANALYSIS

A trend analysis shows the development of key criteria for social development over the past 5 years in the village. Specific criteria have been selected for each one of the four dimensions of poverty (DFID 1995). These may be affected, among other influences, by the use of improved firewood stoves. For the assessment, a range from 1 (= very bad) to 5 (= very good) is available for each year.

YEAR	2003	2004	2005	2006	2007	General trend * 2004-2007
Living standards (1st dimension)						
Agricultural yields						●
Family income / Income of women						++
Health of children / Health of mothers						+
Clothing						
Housing						
Access to resources (2nd dimension)						
Firewood						
Land for planting trees						
Knowledge (3rd dimension)						
Education of girls						
Skills for women						
Rights and power (4th dimension)						
Participation of women in village meetings						
Participation of women in decision making of Village Committees and in leadership positions						

KEY: ●●●● = Very positive, ●●●● = positive, ●●● = So so/Medium, ●● = Negative, ● = Very Negative

* To be filled out by the facilitators in the end: Positive trends: ++ or + ; Negative trends: -- or - ; Neutral : - +

Start by drawing a table on the ground with locally available material (sticks, leaves, seeds). Use some cards for the years (2003 – 2007) placed on top, as well as other cards with the translated criteria placed on the left side of the table. Explain the table and the task to the women. Please, do not ask them questions, just ask them to evaluate themselves the situation for each criteria (e.g. for the agricultural yields) in the village for the specific year. The participants will discuss among themselves and put a certain number of seeds or stones in the respective field. Please, note whatever they are discussing (e.g. 2003 was a bad year, as the village experienced some drought and the yields were very low and were not enough to feed the families or in 2005 they managed to yield a lot of maize due to the improved varieties and planting methods). Let the women discuss and fill out one year after the other for each criterion.

2 - ACTIVITY LIST

Development activity	Organization	Relevance for daily life	Beneficiaries	Percentage of population benefiting

KEY

●●●●● Very relevant, ●●●● Relevant, ●●● Medium relevance, ●● Little relevance, ● No relevance

First: Identify the actual or past development activities carried out in the community, and the respective organizations, as listed by the participants. (Do not forget to ask village members for their own development activities)

Second: Ask what they felt about these activities. Invite the participants to rank the relevance of the activity on the daily life of the village, using a range from '1 = no relevance' to '5 = very relevant'.

Third: Ask the participants to identify the beneficiaries (women, men or children). Do not ask closed questions such as 'And the children? Do they benefit?' The participants themselves should discuss whether they want to consider men, women or children as beneficiaries or not.

Fourth: Invite the participants to discuss the percentage of the population benefiting from each of these development activities.

ACTIVITY LIST - Example

Development Activity	Organization	Relevance for daily life	Beneficiaries	Percentage of population benefiting
Health station	Government	●●●●●	Men + Women	100%
School	UNESCO	●●	Children	
Poultry	WORLD VISION	●●●	Women	10%
HIV-AIDS	UNDP	●●●	Men	
Passion fruit	PSDA-GTZ	●●	Women	
Stove project	GTZ	●●	Women	50%

3 - INFLUENCE MATRIX

The influence matrix shows the impact of development activities on the criteria of poverty, and the assessed strength of influence. Again a range from 1 to 5 is used (Very weak influence to very strong influence). Negative effects are marked with a negative sign (e.g. -3) thus direct and indirect, positive and negative influences can be shown. The sums are included in the final row and at the bottom and show the key activities influencing the criteria

Influence of each development activity on each criterion of poverty	e.g. dispensary	e.g. school	e.g. poultry	e.g. improved stoves	e.g. water	Sum
Increase or decrease of <i>living standards</i>						
Agricultural yields						
Family income / Income of women						
Health of children / Health of mothers						
Clothing						
Housing						
Access to or exclusion from <i>resources</i>						
Firewood						
Land for woodlots						
Increase or decrease in <i>knowledge</i>						
Education of girls						
Skills of women						
Access to or exclusion from <i>rights and power</i>						
Participation of women in village meetings						
Participation of women in decision making of village committees and in leadership positions						
Total						

KEY: ●●●●● = Very strong influence, ●●●● = Strong influence, ●●● = Medium influence, ●● = Weak, ● = Very weak influence

When arranging the table for this third tool, take each criterion from the first table and put each one on the left side. Use the cards with the identified development activities and put them on the top. Ask the participants to evaluate the influence of each one of the development activities on the criteria by using between 1 to 5 stones or seeds. If they find that there is no influence at all of some development activities on one of the criteria, they may use 0 stones. Please, note all the relevant arguments they provide during their discussion among themselves. At the end, copy all the tables that the participants have filled in on the ground.

ANNEX VII

Steps and Procedures for Impact Assessment in Kenya

This annex describes the procedures used in the Impact Assessment (IA) in Kenya (Oct. 2007 – Feb 2008). Using a participatory approach, two external consultants collaborated closely with national GTZ staff, local component coordinators, and the regional project staff in the field (called Cluster Managers) to prepared and organise the assessment.

Preparation

1. Project team selected Enumerators as follows:
 - Students and preferably experienced with surveys
 - Qualified, self confident, communicative
 - Provided with bags, pencil, rubber; exchange telephone number
 - Received a certificate in the end
2. Project team, together with consultants, developed a time frame for the assessment, its preparation and implementation.
3. Districts, villages, households, schools, restaurants and producers were selected (according to selection criteria³)
4. Local authorities were informed about the visits

Results chains

5. The consultants, together the local team, developed the project's results chains⁴. The project strategy was analysed using these results chains, and relevant assessment fields for the impact assessment were identified along them. Result Indicators were formulated.

Impact indicators

6. The project team developed impact indicators and these were compared with the HERA list of impact indicators described in the EnDev Impact Assessment Guide⁵. The information from this study was used to check how well the indicators in this document worked
7. Some of the Criteria for Sustainability of a Market System, developed by HERA,⁶ were included in the list of indicators along the results chain.
8. Questionnaires were developed jointly:
 - Questionnaires about the use of stoves in households, schools, restaurants
 - Questionnaires about the production of stoves by stove producers/traders
 - Interview guides for village head interviews
 - PRA tools for group discussions

Introduction of household survey questionnaire to cluster managers and enumerators

9. Cluster managers and enumerators were introduced to the household survey questionnaire, and their roles were clarified. During a two-day workshop, enumerators were trained on how to apply the questionnaires, and cluster managers were trained so that they could backstop the work. The workshop dealt with several topics:

Day 1:

- a. Presentation of the purpose, scope and aim of the assessment
- b. Presentation of the household (HH) questionnaire
- c. Reviewing the questionnaire, question by question, to clarify and discuss each question as needed with the enumerators
- d. Role play:

³ Selection criteria available

⁴ Document outlining Results Chains is available.

⁵ EnDev Guide and List of impact indicators available.

⁶ Sustainability Criteria as model available.

Enumerators were split into groups of four, joined by one cluster manager and one of the consultants. Within the groups they conducted a make-believe interview, with each of the team playing the role of interviewer, house wife, husband etc. One enumerator, and one cluster manager in each team observed the events, and was able to judge how successfully the interview had been conducted.

- e. Analysis of role play – separately as observer, cluster manager, interviewer and family: along questions:
 - What went well for you/your observation?
 - Which questions/situations caused any difficulties?
 - What would you do better next time to improve the interview?
 - What recommendations would be give others to improve the interview?
- f. Feedback round
 - Feedback from each person within a group, starting with the interviewer
 - Documentation of the main observations and lessons learnt for later presentation to other groups
- g. Repetition the role play with changing roles/players to consolidate lessons learnt
- h. Full session for groups to meet again and exchange their experiences.

Day 2:

- a. Pre-testing of questionnaire in the field; splitting into teams of two enumerators and one person to backstop, and pre-testing the questionnaire within selected village(s) that had agreed to take part. Each pair of numerators sent out to a household, with one cluster manager to backstop their activities.
- b. In each household, one enumerator conducts the interviews, while the other enumerator and the cluster manager observe their performance.
- c. In the next household the enumerators change roles.
- d. After visiting two households, they provide feedback to each other. The findings are documented for exchange with other teams.
- e. All groups come together for a full session to exchange their experiences in the field.

Day 3 (optional):

- f. Training of enumerators in technical issues about cooking energy. This comprises stove maintenance, replacement of stoves, fixing common stove problems, good cooking practices
- g. Translation of questionnaire into local language(s), if needed
- h. Joint development and review of remaining methodological tools with project team.
- i. Pre-testing each tool
- j. Feedback round: exchange of experiences in using these tools
- k. Reviewing and adjusting methodological tools if necessary.

Implementation

- a. Logistics - transport, accommodation, food, materials
- b. Maximum number of household interviews per day and enumerator: 5
- c. Backstoppers coordinate and calculate time for enumerator supervision during interviews, interviews with producers and gathering all enumerators for feedback round each day
- d. Backstoppers review all filled out questionnaires, to guarantee complete and correct information

Data analysis

- e. Data entry
- f. Data analysis
- g. Data interpretation – in exchange with the project team (in a workshop)
- h. Report writing

Implementation

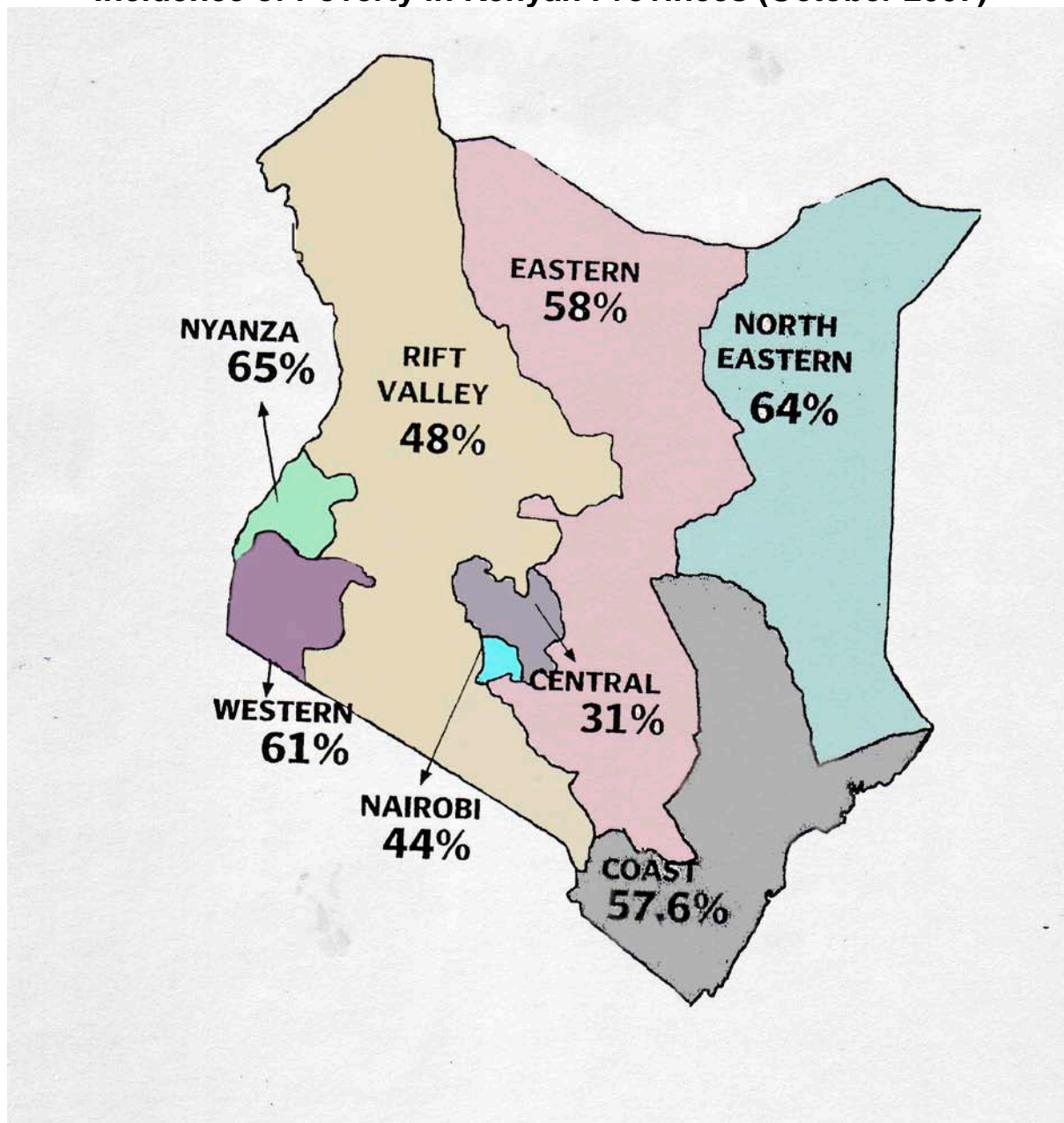
- i. Organisational preparation (transport, accommodation, food, material)
- j. Maximum number of household interviews per day and enumerator: 5
- k. Backstoppers coordinate and calculate time for enumerator supervision during interviews, interviews with producers and gathering all enumerators for feedback round each day
- l. Backstoppers review all filled out questionnaires, to guarantee complete and correct information

Data analysis

- m. Data entry
- n. Data analysis
- o. Data interpretation – in exchange with the project team (in a workshop)
- p. Report writing

ANNEX VIII

Incidence of Poverty in Kenyan Provinces (October 2007)



ANNEX IX: Poverty criteria for selection of households by village chiefs

In general, the criteria mentioned by the local chiefs and key actors related to:

- Materials used for building
- Food availability
- Level of education
- Average income level
- Quality and state of clothing

Murang'a district, Mugoiri location

Criteria for selection of households in this location were based on discussions with chiefs, sub-chiefs, division home economic officers, the stoves cluster manager (central) and programme officer

Poor	Medium	Better Off
<ol style="list-style-type: none"> 1. Houses are made of mud and have cracks/holes 2. Family takes less than two meals per day 3. Families do not attend any form of meetings. They do not associate with people except for weddings where food is provided 4. They do not use farm inputs such as manure, certified seeds and fertilizer, so their farms are neglected 5. They wear very cheap second hand clothes that are torn and dirty. 6. They have no chicken or livestock. 7. Children are weak and in poor health, infested with jiggers and fleas. 8. They do not like visitors. 9. Toilets are covered with bags. 10. They have very few/poor utensils and seats. 11. Children do not always go to school because of lack of food and uniform. 12. House is poorly thatched with grass and polythene. 14. Some have only single room divided by polythene. 15. Homes are quite dirty. 	<ol style="list-style-type: none"> 1. Houses are made of off-cuts, iron sheets and some with stone walls. 2. Family can take three meals per day. 3. They associate fairly regularly with other people 4. They can afford some farm inputs. 5. They keep dairy animals and/or simple livestock 6. They do not employ farm labourers 7. They wear clean clothes, though some are second hand. 8. They own Bicycles 	<ol style="list-style-type: none"> 1. Houses are stone walled and well maintained 2. Families keep dairy animals in zero grazing units. 3. They employ at least one worker and hire casuals. 4. Their clothes are clean. 5. They send their children to boarding schools. 6. They regularly use farm inputs so crop yields are good. 7. They run their own businesses. 8. They are comfortable associating with other people 9. They own housing plots in town. 10. They are opinion leaders and influencers 11. They tend to be elected members in groups.

Murang'a South (Maragwa district) Kigumo Location

The selection of poor, medium and better off criteria was provided by chiefs and sub chiefs

Poor	Medium	Better off
<ol style="list-style-type: none"> 1. Families can only build simple dwellings that are mud-walled, tin or iron sheets 2. Latrines serve a group, and are made of polythene. 3. Most families are not well fed and are malnourished. They only eat <i>githeri</i> (boiled maize) 4. They seldom own livestock, though a few may own a few free-range chickens 5. Most are casual laborers 6. They buy extremely cheap second hand clothes which are usually dirty. 7. They do not have land on which to plant their own crops and trees, unless it is rented. 8. Their children usually do not go to school. 9. They do not attend meetings 	<ol style="list-style-type: none"> 1. They own their houses which are made of offcuts and iron sheet walls - clean and well maintained. 2. Families own pieces of land. 3. They can afford to buy furniture for homes. 4. They use farm inputs moderately. 5. Some have bank accounts. 6. Clothes are good and clean. 7. The family is generally healthy looking. 8. They live in social groups – use merry go rounds and table banking for saving 9. Keep their animals, including cows, in simple sheds. 10. They have pit latrines made of off cuts of building materials 	<ol style="list-style-type: none"> 1. Families send their sons and daughters into tertiary education 2. Seek good jobs 3. Have stone houses that are well maintained permanent structures 4. Run their own businesses 5. Own private cars. 6. Tend to be elected as opinion leaders and group leaders. 7. Employ casual workers and labourers both in the house and in their farms. 8. Have bank accounts. 9. The families are healthy 10. Some have stone pit latrines, and/or toilets inside the house. 11. Some own coffee dehulkers.

ANNEX X: Description of Kenyan ICS

Jiko Kisasa - Kuni mbili

Name: Kuni mbili (Kenya)
Type: Portable, metal clad liner
Fuel: Fuel wood
Users: Urban, rural and peri-urban households

General description

Ceramic liner which is metal clad with the following properties:

- one pothole
- single fuel feed door
- accommodates different pot sizes
- circular shape of 16 cm height and 25 cm top internal diameter
- metal cladding on the outside

Materials used:

Fired clay product clad with sheet steel. The stove is assembled using vermiculite, lime and cement as binding materials.

It has a lifespan of 3 years

Production:

Ceramic liners are produced in established production centres. The ceramic liners are bought by metal smiths who put a metal cladding around the liner. Sometimes this is done by ceramic liner producer. Once a client buys this stove it is not built in, and can be used directly.

Efficiency

The stove has an efficiency of 40% if used properly; using dry firewood is one of the most important factors



Prices:

The prices vary from Ksh. 450 – 800 depending on the location and the metal used in cladding (2009).

Source of pictures:

GTZ – Promotion of Private Sector Development in Agriculture
P.O. Box 41607, 00100 Nairobi, Kenya

anna.ingwe@gtz.de

Jiko Kisasa - one /two pots

Names: Jiko Kisasa (Kenya)

Type: Inbuilt one or two fixed liners

Fuel: Fuel wood

Users: rural and peri-urban households

General description

Fixed, inbuilt stove with

- one or two pots potholes
- single fuel feed for each pot
- independent firewood chamber for each pot
- accommodates different pot sizes
- circular shape of 16 cm height and 25 cm top internal diameter

Materials used:

The Jiko kisasa is mainly a fired clay product. It has a lifespan of 3 years

Production:

Ceramic liners are produced in established production centres. The ceramic liners are bought by marketing groups or installers. These are sold to potential clients. The ceramic liners require a trained stove installer to fix the stove in the kitchen.

Efficiency

The stove has an efficiency of 40% if used properly. It is very important to use dry firewood.

Prices:

The price for the ceramic liner varies between Ksh. 100 – 250. An extra Ksh. 50 – 250 is required as installation fee for each unit if it has to be fixed in the kitchen (2009).



Jiko kisasa one pot



Jiko kisasa two pots

Source of pictures:

GTZ – Promotion of Private Sector
Development in Agriculture
P.O. Box 41607, 00100 Nairobi, Kenya

anna.ingwe@gtz.de

Rocket stove - one /two pots

Names:	Rocket stove (Kenya)
Type:	Inbuilt one or two pot stove
Fuel:	Fuel wood
Users :	Rural and peri-urban households

General description

Fixed, inbuilt stove with

- One or two pots potholes
- Single fuel feed for each pot
- Independent firewood chamber for each pot
- Different pot sizes can be accommodated
- Circular shape of 16 cm height and 25 cm top internal diameter

Materials used:

The Rocket stove can be built with either good clay soil or fired clay soil bricks with a lifespan of 5 years. It could be more especially for the brick stove.

Stove Construction:

Rocket stove construction requires a technically trained stove builder. The client acquires all the necessary construction materials and the stove is built in the kitchen on a selected site.

Efficiency:

The stove has an efficiency of 50% - 60% if used properly. This includes using dry firewood as one of the most important factors.

Prices:

The price for the rocket stove varies between Ksh. 300 – 10,000 depending on the type of material used and the size of the stove (big size for institutional stove) but negotiable.



Rocket stove one pot

Rocket stove two pots



Source of pictures:

GTZ – Promotion of Private Sector Development in Agriculture
P.O. Box 41607, 00100 Nairobi, Kenya
anna.ingwe@gtz.de

Institutional Rocket Stove

Names:	Institutional Rocket Stove (Kenya)
Type:	Inbuilt one or two pot stove
Fuel:	Fuel wood
Users:	Rural and peri-urban households

General description

Fixed, inbuilt stove with

- one or two pot holes
- single fuel feed door for each pot
- independent firewood chamber for each pot
- the size of the stove needs to be built to take the pot sizes required

Materials used:

Institutional rocket stoves are made using clay-fired bricks, cement, sand, and fire cement, and the shelf for feeding in firewood is made of steel. Alternatively, fired clay bricks with good clay soil as a mortar can be used, but this will require frequent maintenance. For large quantities of food, a metal ring is placed at the neck of the stove to help support the weight of the food being cooked.

Production:

Institutional rocket stoves are constructed by trained technicians, mostly working individually.

Efficiency

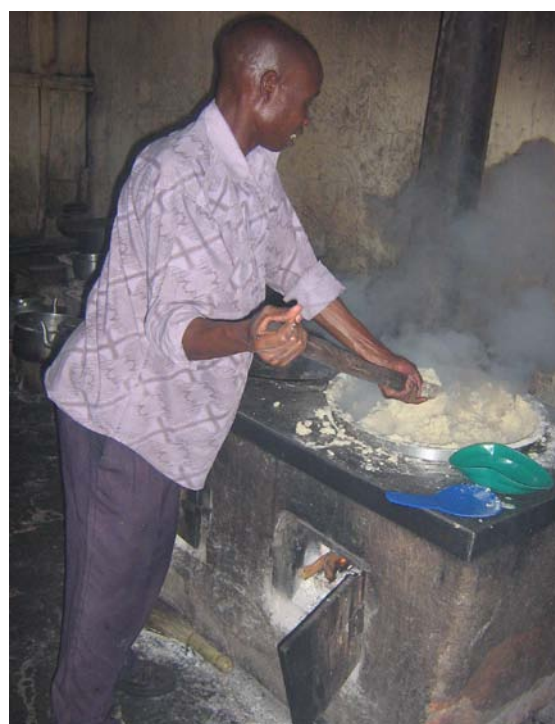
The stove has an efficiency of 70% if used properly. It is very important to use dry firewood.

Prices:

The price for the ceramic liner is between Ksh. 25,000 – 180,000. This depends on the size of the stove, and the materials used in its construction. It often includes provision for a suitable cooking pot and a lid (2009).



Institution Rocket Stove



Source of pictures:

GTZ – Promotion of Private Sector
Development in Agriculture
P.O. Box 41607, 00100 Nairobi, Kenya
anna.ingwe@gtz.de

Firewood Baking Oven

Names: Firewood baking oven (Kenya)

Type: Double chamber

Fuel: Fuel wood

Users: Rural and peri-urban households

General description

Firewood baking oven using rocket principle in the fire chamber

- capacity for 120 loaves
- single fuel feed door
- baking period 45 minutes per batch
- the baking oven is a fixed structure, it must be built in the shade, and away from rain.

Materials used:

The baking oven is mainly made of fired clay bricks, sand, cement, pumice, and made from stainless steel metal.

It has an estimated lifespan of 10 years, with yearly maintenance to clean the soot around the baking chamber.

Production:

The baking ovens are constructed by trained technicians on site.

Efficiency

The baking oven has an efficiency of 70% if used properly. Using dry firewood is essential.

Prices:

The price for the baking oven is between Ksh. 180,000 – 220,000 including labour, depending on the quality of the materials used (2009).



The firewood baking oven



The baking chamber



Source of pictures:

GTZ – Promotion of Private Sector Development in Agriculture
P.O. Box 41607, 00100 Nairobi, Kenya
anna.ingwe@gtz.de

Soil Sterilizer

Names: Soil sterilizer (Kenya)
Type: Passion fruit soil sterilizer
Fuel: Fuel wood
Users: Rural and peri-urban households

Prices:

The price for the construction of the sterilizer is Ksh. 25,000 per single unit, including labour (2009).

General description

This is a fixed rocket stove, on which a 200 litre drum is placed, half full of water. The tank is connected by a galvanised iron pipe to another drum of the same size set behind it. The second drum holds the soil to be sterilized. The water boils to create water vapour. For 4.5 hours, the vapour goes through the pipe and passes through the soil to be sterilized, after which the vapour comes out at the top of the tank behind. This process helps to kill all the diseases and weeds from the soil used in the nurseries to raise passion fruits seedlings.

Materials used:

The stove is made of fired clay bricks, sand, cement and lime, and metal drums are used for holding the water and the soil.

Production:

The sterilizers are constructed by trained stove technicians, working on a purely commercial basis.

Efficiency

The sterilizer has an efficiency of 70% compared to the traditional way of sterilizing the soil where a three-stone fire is used.



Sterilizer (multiple installation)

Source of pictures:

GTZ – Promotion of Private Sector Development in Agriculture
P.O. Box 41607, 00100 Nairobi, Kenya
anna.ingwe@gtz.de

Cooking basket

Names: Fireless cooker (Kenya)
Fuel: No Fuel
Users : rural, peri - urban and urban households

General description

This is a cooking basket, which is insulated to help maintain the temperature of the food so that the cooking process can continue over time, using the heat contained in the food itself when placed in the basket.

The cooking process starts on a normal fire and once the food is boiling, it is moved to the basket in the shortest time possible, while making sure that the pot is properly covered to keep the heat inside the food.

- Temperature drops gradually over eight hours
- Can be made out of a basket or a carton or box
- Insulation material can be any sort of insulating material (eg straw, old clothes etc.)
- Can be made in different sizes

Materials used:

The fireless cooker is made of basket (box), insulation materials, covered in polythene sheet to prevent the insulation material getting wet, then followed by a nice looking piece of cloth material which is sewn in while creating space for the pot.

Production:

Fireless cookers are produced by trained women groups and individuals, all of them doing this as a business.

Efficiency

The fireless cooker has an efficiency of 40% - 90% depending on the type of food being cooked. The highest saving is gained when cooking the hard grains such as maize and beans.

Prices:

The price for the fireless cooker varies between Ksh. 600 – 2000. This price variation depends on the size of the fireless cookers. The bigger the basket, the higher the price (2009).



Fireless cooker



Fireless cookers

Source of pictures:

GTZ – Promotion of Private Sector Development in Agriculture
P.O. Box 41607, 00100 Nairobi, Kenya
anna.ingwe@gtz.de

ANNEX XI: Additional figures and tables on household survey results

Figure XI.1: Distribution of households with improved firewood stoves by rural and urban category, and by type of ICS (general household Survey)

HH Category	Jiko Kisasa – 1 pot	Jiko Kisasa – 2 pots	Kuni Mbili (portable)	*RMS – 1 pot	*RMS – 2 pots	Total
Rural (N = 94)	44 43%	23 22%	7 7%	4 4%	25 24%	103 100%
Urban (N = 29)	7 22%	9 28%	1 3%	6 19%	9 28%	29 100%
Total (N = 123)	51 38%	32 24%	8 6%	10 7%	34 25%	123 100%

*RMS=Rocket Mud Stove

Figure XI.2 : Distribution of households with improved firewood stoves by socio-economic category (general households survey)

HH Category	Jiko Kisasa – 1 pot	Jiko Kisasa – 2 pots	Kuni Mbili (portable)	*RMS - 1 pot	*RMS - 2 pots	Total
Better off (N = 47)	15 32%	14 30%	1 2%	2 4%	15 32%	47 100%
Medium poor (N = 61)	21 34%	12 20%	3 5%	6 10%	19 31%	61 100%
Poor (N = 27)	15 56%	6 23%	4 14%	2 7%	0 0	27 100%
Total (N = 135)	51 38%	32 24%	8 6%	10 7%	34 25%	135 100%

*RMS=Rocket Mud Stove

Figure XI.3: Distribution of households with improved firewood stoves by Cluster

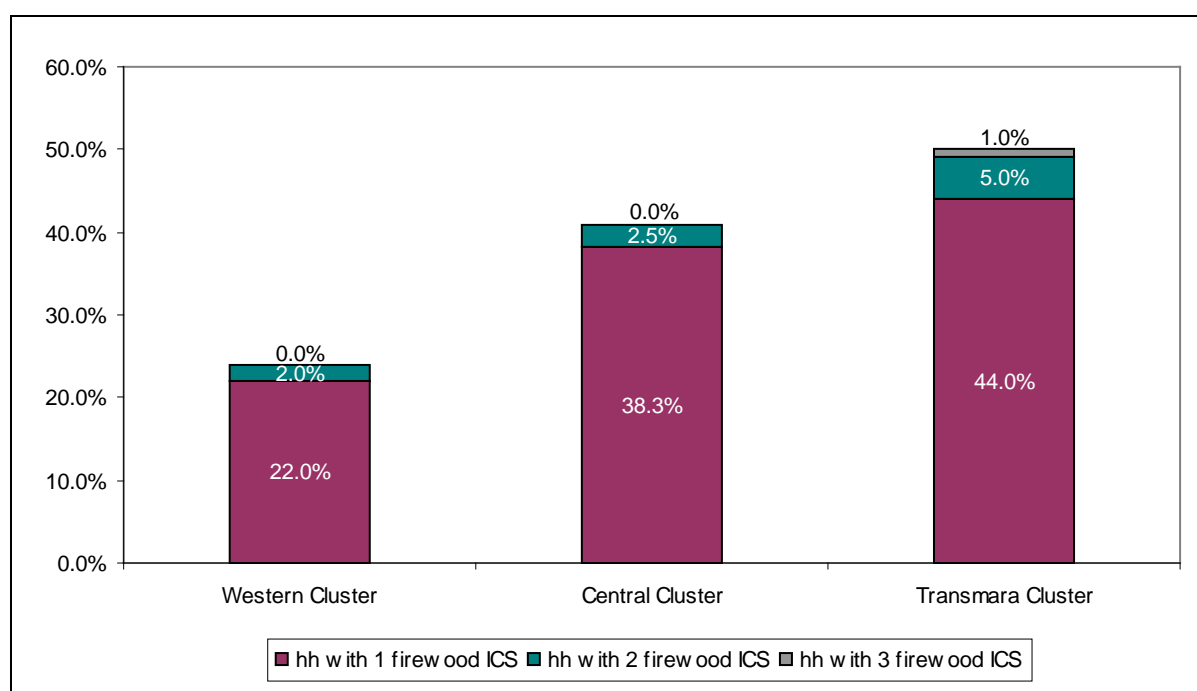


Figure X1.4: Stated reasons for non-use of firewood ICS by socio-economic category

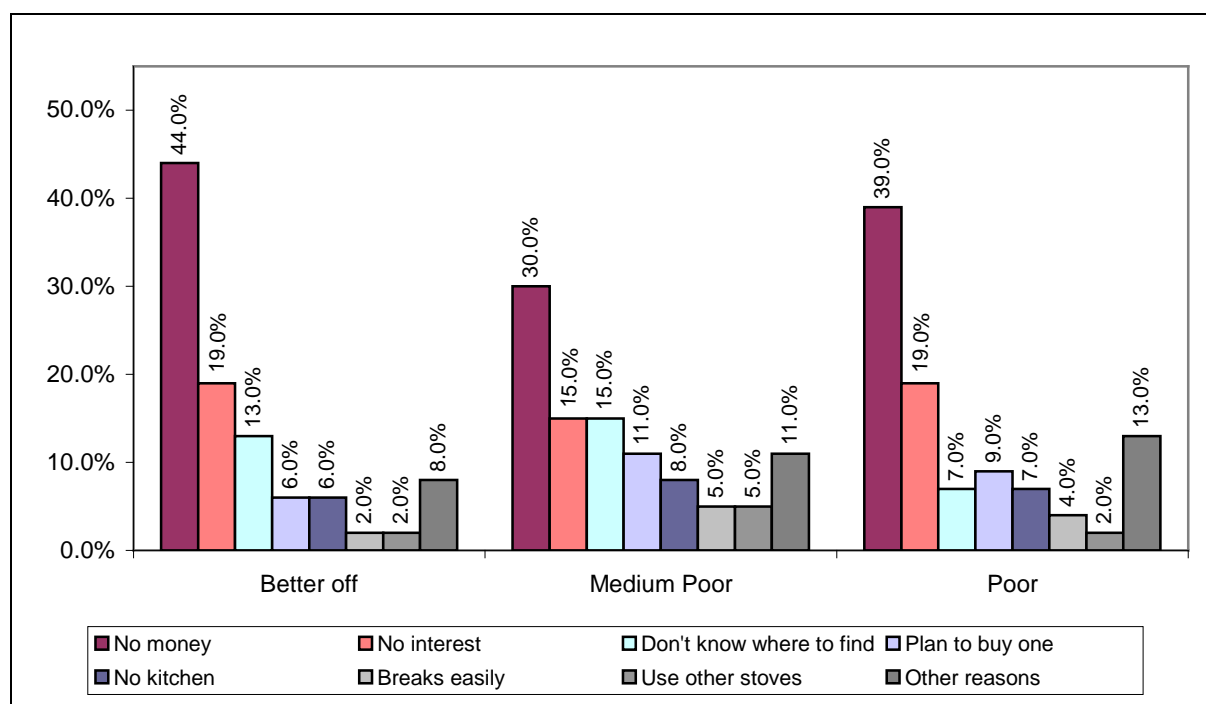


Table X1.5: Clusters and reasons for non-use

Cluster		Reason for non-use										Total
		No money	No interest	Do not know where to find	Lacking kitchen	Planning to buy one	Use other type of stove	Breaks easily	No info on ICS	Other reasons	Do not use firewood	
Central	N=55	25	10	2	4	8	1	1	4	5	0	60
	%	42	17	3	7	13	2	2	7	8	0	100
Transmara	N=65	27	14	9	5	7	4	3	1	3	2	75
	%	36	19	12	7	9	5	4	1	4	0	100
Western	N=56	22	11	11	5	4	1	3	2	4	1	64
	%	34	17	17	8	6	2	5	3	6	0	100
Total	N=176	74	35	22	14	19	6	7	7	12	3	199
	%	37	18	11	7	10	3	4	4	6	2	100

Table XI.6: Rural/urban area and reasons for non-use

Household category		Reason for non-use										Total
		No money	No interest	Do not know where to find	Lacking kitchen	Planning to buy one	Use other type of stove	Breaks easily	No info on ICS	Other reasons	Do not use firewood	
Rural	N=128	55	24	18	11	12	5	4	6	9	2	146
	%	38	16	12	8	8	3	3	4	6	1	100
Urban	N=48	19	11	4	3	7	1	3	1	3	1	53
	%	36	21	8	6	13	2	6	2	6	2	100
Total	N=176	74	35	22	14	19	6	7	7	12	3	199
	%	37	18	11	7	10	3	4	4	6	2	100

Table XI.7: Socio-economic status and reasons for non-use of ICS

Household economic status		Reason for non-use										Total
		No money	No interest	Do not know where to find	Lacking kitchen	Planning to buy one	Use other type of stove	Breaks easily	No info on ICS	Other reasons	Do not use firewood	
Better off	N=44	21	9	6	3	3	1	1	1	2	1	48
	%	44	19	13	6	6	2	2	2	4	2	100
Medium	N=57	20	10	10	5	8	3	3	3	3	1	66
	%	30	15	15	8	12	5	5	5	5	2	100
Poor	N=75	33	16	6	6	8	2	3	3	7	1	85
	%	39	19	7	7	9	2	4	4	8	1	100
Total	N=176	74	35	22	14	19	6	7	7	12	3	199
	%	37	18	11	7	10	3	4	4	6	2	100

Figure XI.8: Distribution of households by cluster and fuel used to cook (General-households survey)

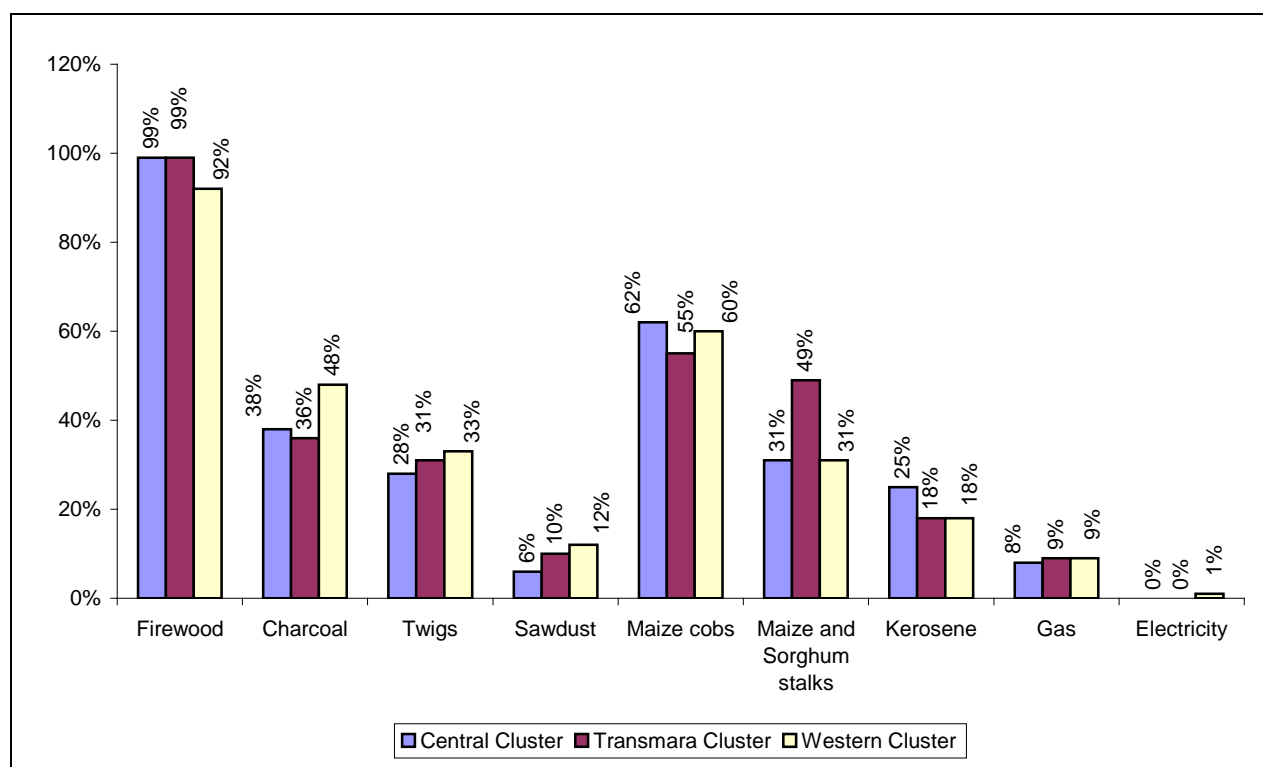


Figure XI.9: Person in charge of firewood collection from the ICS households survey (multiple response)

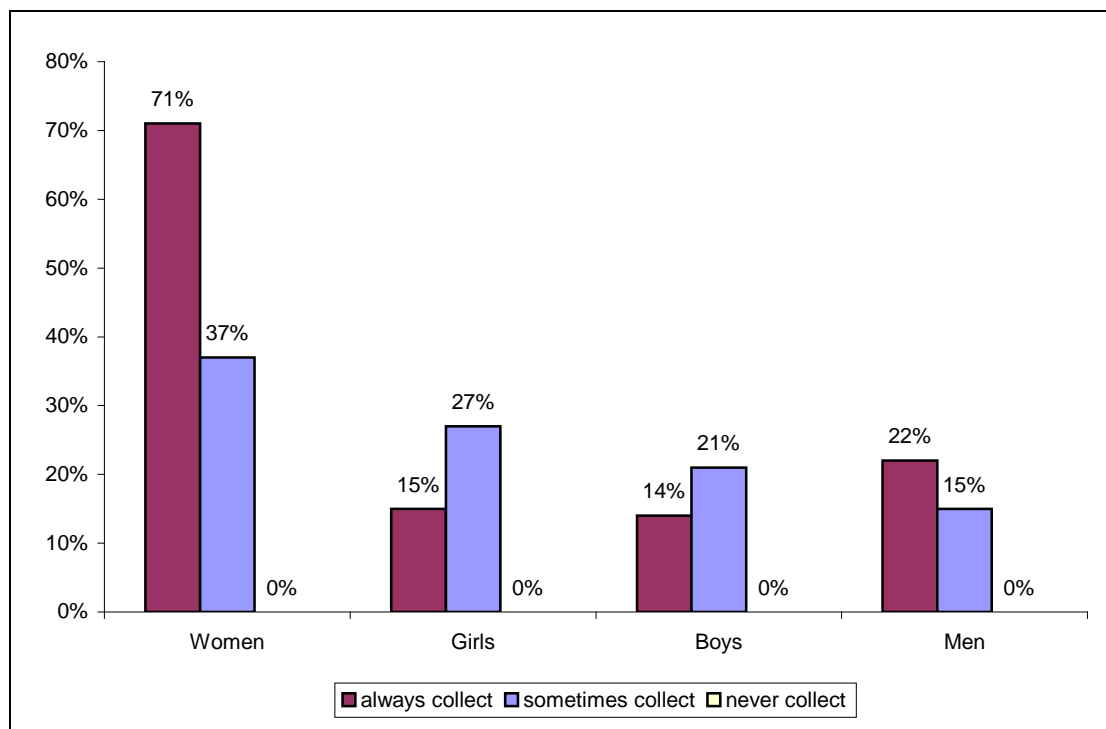
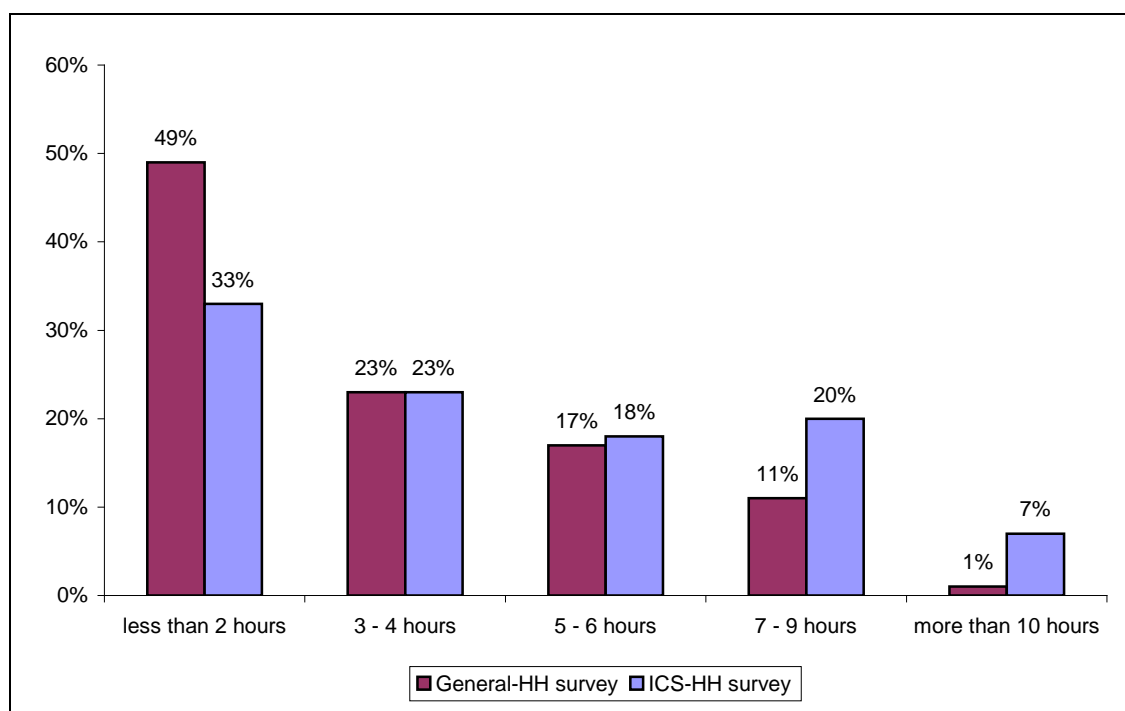


Figure XI.10: Time spent on firewood collection per week



ANNEX XII:

Additional figures and tables on stove dealers survey results

Most stove dealers were married (73% of producers, 76% of installers and 75% of marketers). About half of them lived in a family group of four to six members. This is slightly above the national average of 41% of households with four to six members. The average size of the interviewed stove dealers' households was six members.

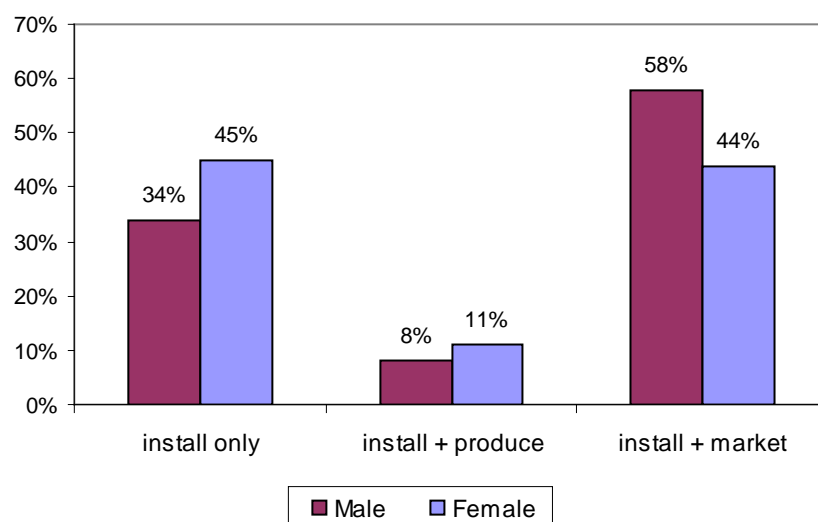
Stove dealers interviewed belonged to all age groups, from 20 years of age to 50 years and above. There was a tendency for more men than women in the younger age group to be involved in stove businesses, and more women than men in the older age group. This may be because older women tend to have greater mobility than younger ones, who are occupied with child bearing and child care.

Table XII.1: Distribution of stove dealers by age and gender

Age group	Producers		Installers		Marketers		Total
	Men	Women	Men	Women	Men	Women	
20 – 29 years	2	2	6	0	2	0	12
30 – 39 years	1	5	4	4	2	1	17
40 – 49 years	5	4	1	4	2	2	18
50 years +	0	2	0	1	1	2	6
Total	8	13	11	9	7	5	53

More than half the stove producers were between 20 and 39 years of age (55 %), one third were 40 to 49 years old and 9 % were older than that. The relatively high proportion of older people might be due to the improved availability of production means (capital, land) for this age group.

Figure XII.2: Distribution of stove installers by their stove activities



Among the twelve stove marketers interviewed, nine were also installing stoves and one built them. Apparently, dealers who are only marketers are in a minority and **most stove dealers practiced installing stoves as well as marketing**. This corresponds to the project's strategy, which promotes marketing stoves together with their installation in order to allow people to make a living out of it. Only in a few cases, like HIV groups, were dealers involved in marketing only, and had young people to install of stoves.

The **majority of stove dealers** had become involved in stove business via a **development project**: 47 % through GTZ stove projects (former ones and the latest one) and 34 % through other development actors. Few had been initiated through other stove dealers (9 %) or managed single-handedly to start stove production (12% of producers). From this, it can be drawn that initiation into stove production as an economic activity is not yet a self-sustained process. According to the observations of the author, the number of producers starting by themselves to produce stoves was increasing in Central cluster. Further training is needed by the project to assure quality of the stoves.

Table XII.3: Distribution of stove dealers by gender and how they came into stove business

Means of coming to stove business	Producers		Installers		Marketers		Average Total
	Men	Women	Men	Women	Men	Women	
Through GTZ project	36%	33%	26%	58%	71%	60%	47%
Other development actor	36%	27%	47%	25%	29%	40%	34%
Other stove dealers	-	27%	20%	8%	-	-	9%
By self initiation	18%	6%	-	-	-	-	4%
Other	9%	6%	6%	8%	-	-	5%

Men seemed to be **more likely reached by** the **GTZ projects** and other development projects **than women**. Among the women, initiation through other stove dealers played an equally important role. Men may more easily have launched their business in stove production without support than women. Men appeared to have had a greater sense of entrepreneurship in exploring new activities which might provide an income.

Figure XII.4: Distribution of stove marketers by their stove activity

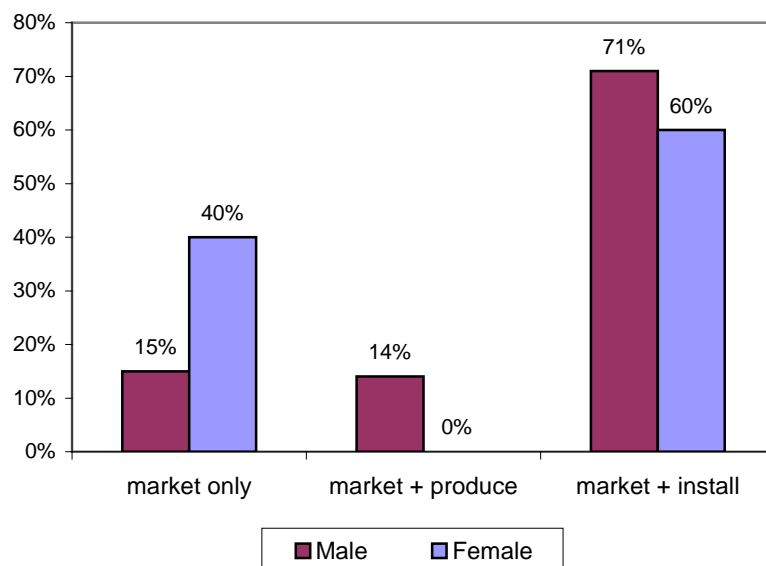
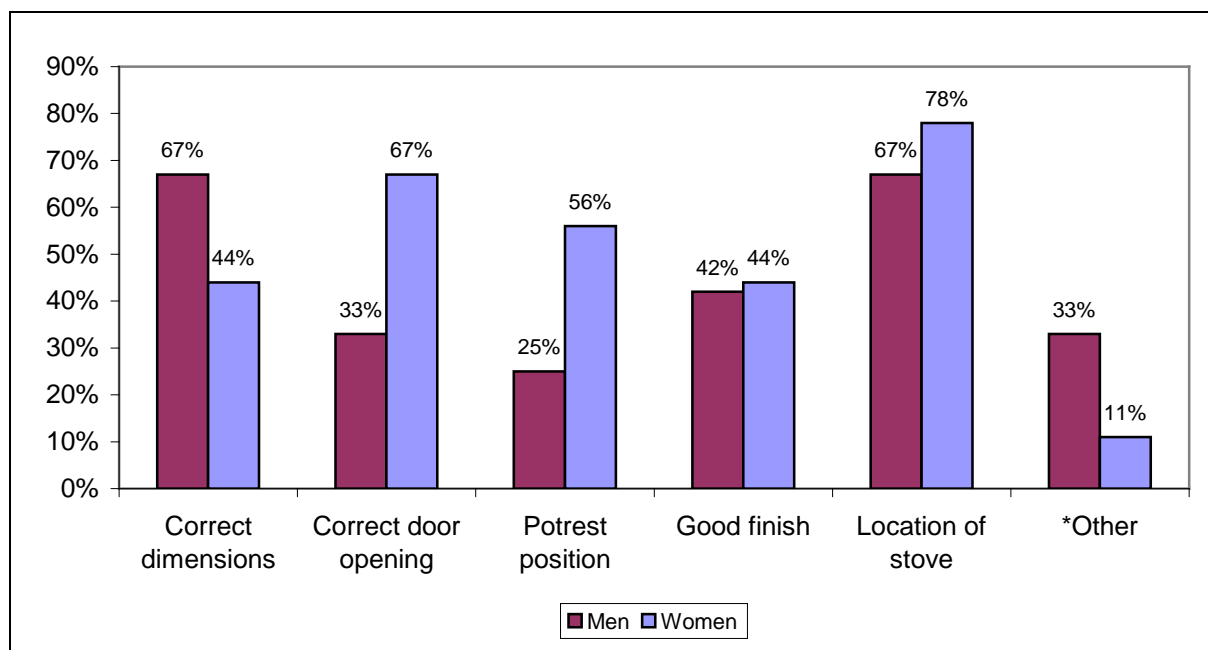


Table XII.5: Distribution of number of stoves produced monthly by producer

	Jiko Kisasa liner	Jiko Kisasa portable	*RMS portable	*RMS fixed 1 pot	*RMS fixed 2 pots	Rocket Brick stove
1 – 10 stoves	-	-	2	2	1	1
11 – 20 stoves	-	1	1	2	1	-
21 – 100 stoves	1	1	-	-	1	-
101 – 150 stoves	5	-	-	-	-	-
151 – 200 stoves	3	-	-	-	-	-
400 – 1000 stoves	3	-	-	-	-	-

*Rocket Mud Stove

Figure XII.6: Distribution of installers by quality criteria followed in production of stoves, by gender



*Other = Choice of appropriate types of soil; level the ground

Figure XII.7: Average number of stove models sold per month per producer

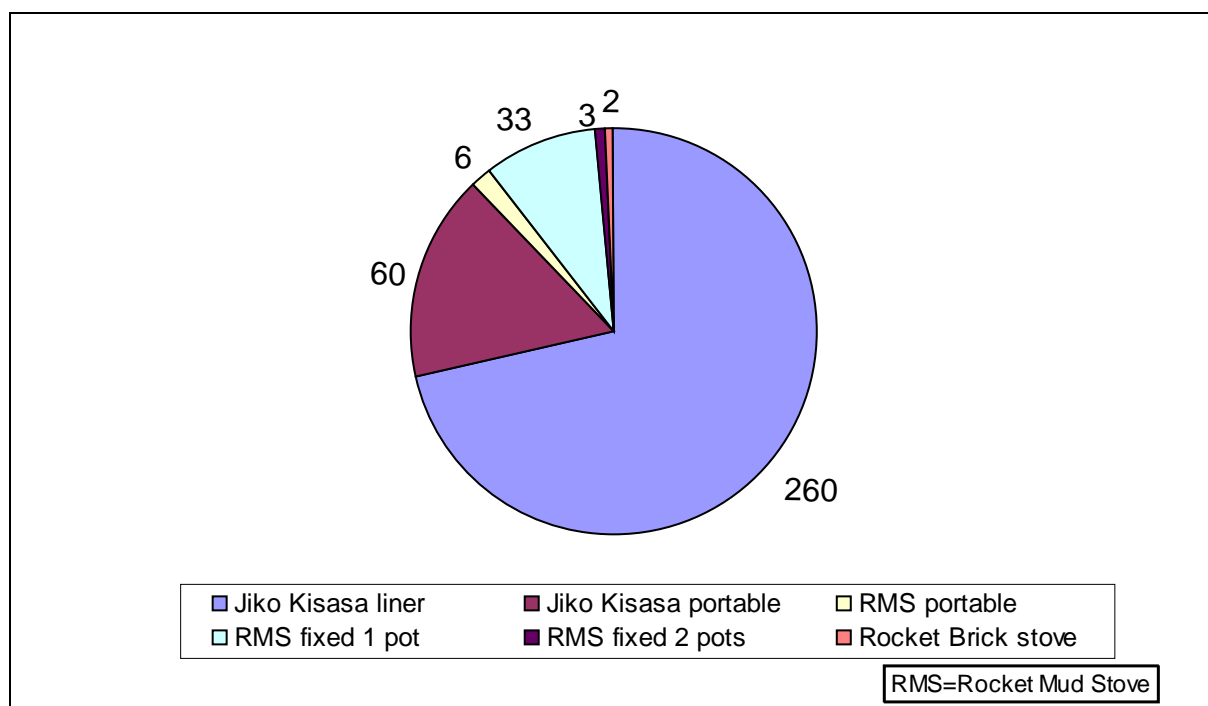


Table XII.8: Reasons for giving stoves out for free

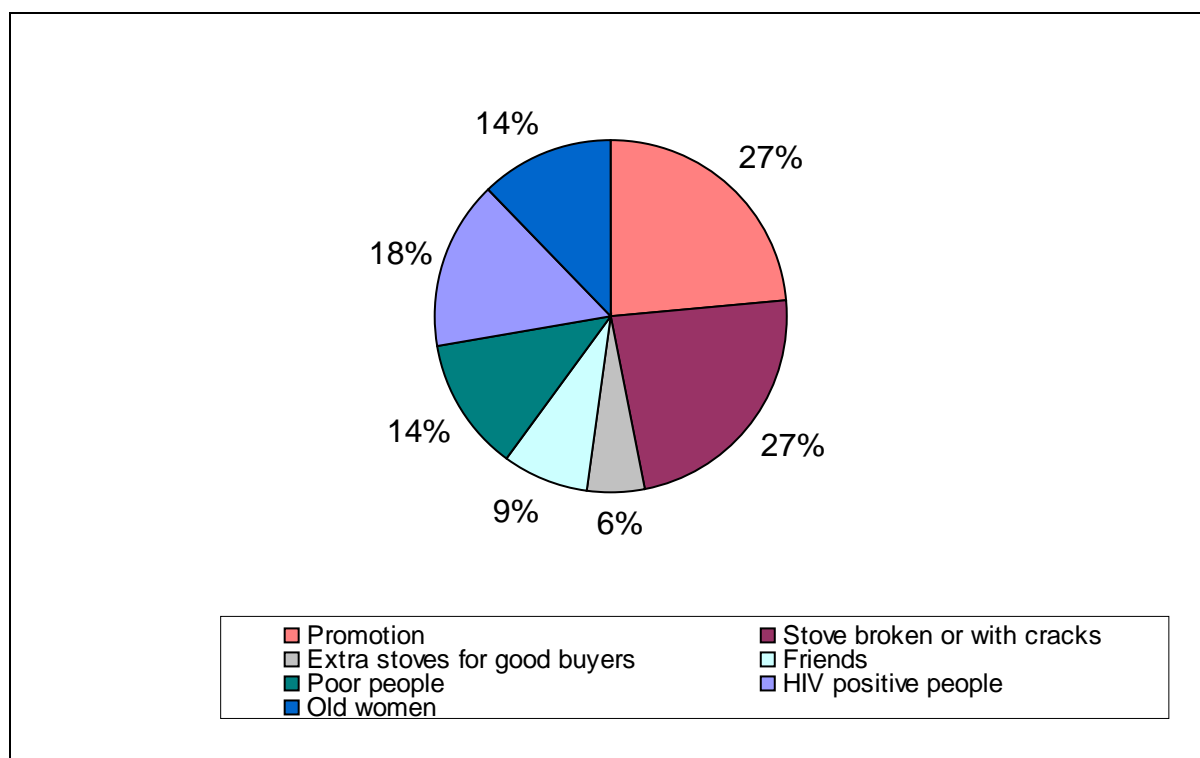


Figure XII.9: Distribution of producers by number of stoves

given for free by gender

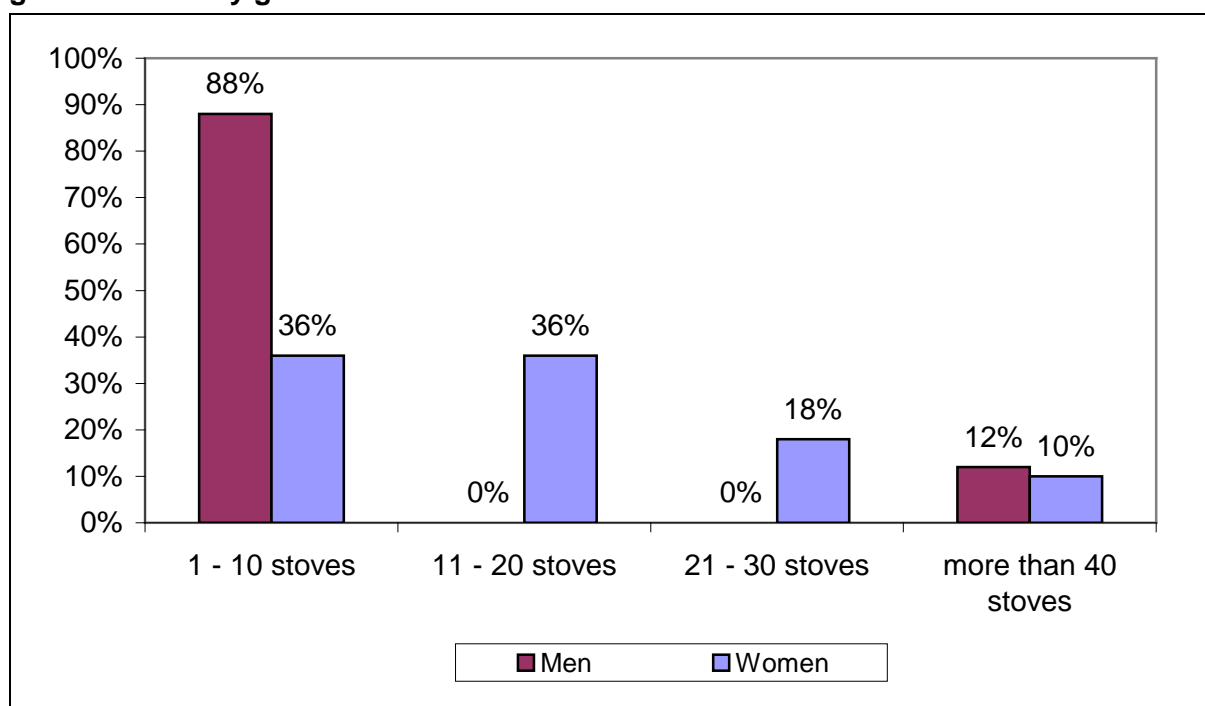


Table XII.10: Distribution of marketers by quantity and prices of liners and stoves bought per month, by gender

		Monthly sales	Selling price per Jiko Kisasa liner	Selling price per Jiko Kisasa portable
Male	Minimum	15	200 Ksh	500 Ksh
	Maximum	300	250 Ksh	800 Ksh
	Mean	100	228 Ksh	640 Ksh
Female	Minimum	10	160 Ksh	450 Ksh
	Maximum	120	300 Ksh	1000 Ksh
	Mean	41	232 Ksh	725 Ksh
Total	Minimum	10	160 Ksh	450 Ksh
	Maximum	300	300 Ksh	1000 Ksh
	Mean	70	230 Ksh	664 Ksh

ANNEX XIII: List of good cooking practices and their effects

Note: Text shown in **bold** indicates that the action affects stove performance

	Cooking practice	Effect
1	Use of lid	Retains the water vapour (very hot) which is returned to the pot, and hence reduces cooking time and the amount of firewood used for cooking
2	Cutting food items into small pieces	Increases the surface area of pieces of food in contact with heat, allowing heat to get through the food into its core, hence cooks through faster and reduces cooking time and the amount of firewood used for cooking
3	Soaking hard grains	Reduces the cooking time hence firewood used is reduced
4	Use of split and dry firewood	Split wood optimises the wood/air mix, allowing air to mix and combust with the wood evenly, improving combustion and reducing smoke. Using dry wood means that the heat given out from burning the wood is not used in vaporising the water in the wood, so the wood is heated more quickly, which reduces the smoke, and more of the heat is available for cooking.
5	Check if chimney is blocked and clean it regularly	Hot air rises up the chimney, making the air at the top of the chimney less dense. This less dense air draws the air into the stove, improving combustion and drawing out emissions. If it is blocked, air cannot be sucked into the fire, causing reduced performance, and smoke cannot escape out of the room.
6	Closing door	Once the fire is fully alight in a stove with a door, the door can be closed (especially for Bellerive stoves) to retain the heat as long as possible. If it is not closed, too much air is sucked into the fire, the fire burns too fast, at too high a temperature, and uses more wood than is needed. .
7	Preparing foods before lighting fire	This helps to save firewood while cooking, since no time is wasted preparing foodstuffs while the fire is alight.
8	Lighting only when needed.	This helps to save firewood since there is no need to start the fire when it is not needed.
9	Use of only a few sticks when cooking	Allows enough air to flow into the stove for proper combustion, so the fuel/air mix is optimised, improving stove performance. Insufficient air means the wood particles cannot react to give out heat, but instead exit the stove as polluting smoke. Too much wood can also put out the fire.
10	Use fireless cooker to complete cooking	This helps save on firewood as only part of the cooking process is done using firewood, before moving to the basket cooker.
11	Day to day removing of ash	This creates space in the fire chamber to allow proper function of the stove and allow proper air flow

ANNEX XIV: Field survey team and participants

NAME	LOCATION
Mr. Omanga	Chief Ibeno location
Mr. Paul Koech	Chief Sibayan location
Mr. Philip Maranga	Enumerator
Mr. Jackson Getega	Enumerator
Mr. Aloys Gwaro	Enumerator
Mr. Benard Mutai	Enumerator
Mr. Steve Kiprono	Enumerator
Ms. Irene Chepngetich	Enumerator
Mr. Ezekiel Moseri	Kiogoro Division Extension Officer/ Supervisor
Mr. Japheth Inyimiri	District Environment and Land Development Officer (DELDO)
Ms. Evelyn Heyi	Cluster Manager/ Supervisor
Ms. Nancy cheruiyot	Division Home Economics Officer, Bomet Central
Mr. Mwasi	Division Home Economics Officer (Div HEO), Keumbu
David Karau	Division Home Economics Officer (Div HEO) Makuyu
Jane Ogova	District Home Economics Officer (DHEO) Maragwa
John Mukuria	Frontline Extension Worker (FEW) Mugoiri
Jane Waihenya	District Home Economics Officer (DHEO) Murang'a
Grace Ndung'u	Division Home Economics Officer (Div HEO) Kigumo
Francis Ng'ang'a	Bremar LTD Institutional Stoves
Peter Gitiba	Institutional Stoves Producer
Nelson T Mureithi	Chief Mugoiri Location
Stephen Kuria	Chief Kigumo Location
Stephen Waweru	Assistant Chief - Kirere Sub Location
Bernard Njuguna	Assistant Chief - - Gachocho Sub Location
Stanely Maina	Assistant Chief - Githima Sub Location
Michael M Gitau	Assistant Chief - Irigu ini Sub Location
Thomas K Mwangi	Assistant Chief - Marumi Sub Location
Boniface Macharia	Assistant Chief - Mirichu Sub Location
Joyce Macharia	Village Elder
John Ndung'u	Village Elder
Nancy Wambui	Village Elder
Margaret Wambui	Village Elder Village Elder
Wilson Kagwa	Village Elder
Judy Waithera	Village Elder
Eliud Kimani	Village Elder
Pauline Wanjohi	Programme Officer – PSDA/supervisor

Nancy Nguru	Cluster Manager /Supervisor
Rachael Kinyanjui	Office Assistant, Central Cluster
Stephen Wambwa	Enumerator
Olivia Khakabo	Enumerator
Linda Ondisa	Enumerator
Patrick Arere	Enumerator
Macdonald Oti ende	Enumerator
Nancy Masakha	Division Home Economics Officer) Lurambi/ PRA Expert
Edward Keya	Sub-Chief, Emanda Vihiga Division
Sammy Alubisi	Chief, Central Maragoli
Kenneth .O. Chanzu	Assistant Chief, Chango, Sub location
Kenneth Bungasi	Chief Bukembe, Location, Bungoma District
Pamela Mahila	Cluster Manager, Western/ Supervisor
Dr. Jacob Kithinji	University of Nairobi, Consultant/ Supervisor

Deutsche Gesellschaft für
Technische Zusammenarbeit (GTZ) GmbH

- German Technical Cooperation -

GTZ Promotion of Private Sector in Agriculture Programme
P.O. Box 41607
00100 GPO Nairobi

Kenya
T +254 20 4228 000
F +254 20 4228 999
E psda@gtzpsda.co.ke
I www.gtz.de